VISUAL RESOURCE ASSESSMENT

A USER GUIDE

MOE Manual 2

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VISUAL RESOURCE ASSESSMENT -A USER GUIDE

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SURVEYS AND RESOURCE MAPPING BRANCH

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PREFACE

British Columbia's landscape is dramatic and extensive in scale. It contains a multitude of natural settings: mountainous areas, plateaus, plains, lowlands and highlands. Climates range from alpine to rain forest with consequent variations in vegetation types. Snow fed glaciers and icefields are common visual attractions and the Province is rich in its abundance of rivers, lakes and streams. Flanked by the Pacific Ocean, its maze of coastal fjords, channels and straits offer almost limitless visual variety. In fact, the province has frequently been described as the most environmentally diverse in Canada (B.C. Parks and Outdoor Recreation Division, 1982).

As British Columbia's population continues to expand, industrial and commercial development pressures are being placed on this highly scenic and visually sensitive environment at an increasing level. All too often such impacts tend to degrade the visual environment.

Meanwhile, British Columbia's scenery has become a primary attraction to Canadian and foreign visitors, and their expenditures provide a rapidly developing source of economic return to the Province. Maintaining British Columbia's scenic assets, its visual environment, thus becomes significant and even imperative in economic as well as aesthetic terms. Management of this environment is presently necessary, and will become increasingly so. Visual management should be based upon an accepted methodology system which accommodates growth and development and is designed to minimize impacts on the natural landscape.

The visual environment is a resource; one needful of as much recognition, identification, classification and management as other renewable resources. It is important that that it be assessed at all planning levels to include its sensitivity, possible deterioration and/or its capability for recovery from visual impacts generated by development activities.

Since 1977, the Surveys and Resource Mapping Branch, Ministry of Environment, has considered the visual resource in its land capability studies. During this period it has become increasingly evident to Branch planners and technicians, as well as to their clients in both the private and public sectors, that a guideline document covering visual analysis methodology is needed.

As a result, the present project was initiated in October, 1981 with the following objectives:

To develop a written and graphically supported document covering (a) terminology inherent to visual resource management in general and (b) a methodology for classification of the landcape in terms of visual assessment, with specific reference to British Columbia.

British Columbia is the third largest of the ten provinces in Canada with an area of approximately 95 000 000 hectares (366 255 square miles). Over 90% of this area is in public (i.e. Crown) ownership. An unequalled opportunity thus presents itself to manage these public lands in the direction of maintaining their outstanding visual resources for all time. The User Guide is intended to further this objective.

ACKNOWLEDGEMENTS

The User Guide represents the efforts of a number of individuals from both the public and private sectors in British Columbia and the U.S. and was written under sponsorship of the B.C. Ministry of Environment.

The author is grateful for the continued criticism and support given this assignment by W.A. Benson, Director, and Norm Sprout, Assistant Director, Surveys and Resource Mapping Branch, Ministry of Environment.

Report review and criticism was carried out during the project writing stages by the following Editorial Committee members:

Jon Secter, Manager, Planning and Assessment Branch, Ministry of Environment: Chairman;

W.H. Van Heek, Landscape Manager, Recreation Management Branch, Ministry of Forests;

Ismet Olcay, Design Section, Parks and Outdoor Recreation Division, Ministry of Lands, Parks and Housing;

Terje Vold, Surveys and Resource Mapping Branch, Ministry of Environment;

Loyd Houston, Surveys and Resource Mapping Branch, Ministry of Environment;

Landscape architects familiar with visual analysis who volunteered their professional time and criticisms at the technical level include Pat Mooney, Lombard North Group, Victoria; David Reid, Pacific Landplan, Nanaimo, B.C.; Bill Blair, Jones and Jones, Seattle; S.R.J. (Steven) Sheppard, University of California at Berkeley; Doug Paterson, Chairman, University of British Columbia School of Landscape Architecture; Peter Rennie, Landscape Coordinator, B.C. Forest Service, Kamloops; and Mike Rocking, Gordon McGlothen and John Block, all with Parks and Outdoor Recreation Division. The User Guide drew upon visual resource management systems currently in use in the U.S., Canada and elsewhere. In this regard, the U.S. Bureau of Land Management was particularly cooperative and supportive in the development of the chapters dealing with concepts and methodology.

Typing services were provided by Joanne Mills, Marilyn Fowles, Christine Lee and Heather Rose. Pete Zimmerman was responsible for design and graphics as well as scheduling the document's layout through to its camera ready stage. Valerie Hignett conducted the document's final technical review.

Finally, grateful acknowledgement is extended to Jean Hnytka, for her time and skill in serving as editorial consultant and English editor throughout all writing stages.

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Visual resource Management has been defined as "the management of the seen aspect of both land and the activities which occur on it...the administration of the land's scenic or aesthetic attributes" (Stone, 1978).

Chapter Separator Photo

PLATE 1.2 Fog lifts to reveal sharp edge contrasts in the early morning light. (B.C. Ministry of Environment photo)

1 INTRODUCTION

1.1 STATE OF THE ART IN BRITISH COLUMBIA

In April, 1977, the Resource Analysis Branch, B.C. Ministry of Environment[1], sponsored a two day workshop in Parksville B.C. designed to bring together individuals from both the private and public sectors dealing with problems related to visual analysis. Proceedings of that conference were subsequently published by the Branch (Yeomans, 1977).

The Parksville gathering was the first of its kind in British Columbia. The working group concluded that there was a need to communicate and exchange information between practitioners in visual management, that a central repository of visual systems and projects should be housed in an appropriate Provincial Government agency and, finally, that a continuing effort be made by those involved in visual management studies to coordinate their efforts toward improvements in application of evaluation techniques.

Visual resource assessments prior to the Parksville session and in the years following have drawn upon a variety of methodologies available at the time through U.S., Canadian and European prototypes. Among such studies carried out by the Surveys and Resource Mapping Branch (Figure 1.1) were the following:

1. A visual sensitivity analysis of the Municipality of Spallumcheen, B.C. Initiated by the B.C. Land Commission, this document portrayed visual sensitivities inherent in the Spallumcheen area and recommended means to maintain their essential quality (Yeomans, 1977).
2. A resource analysis of the Adams River in south central British Columbia, prepared for the B.C. Parks Branch. The report included an extensive section on visual resources and became the basis for a major recreation plan for the Adams River salmon viewing area (Yeomans, et al., 1978).
3. An assessment of the visual impacts of proposed transportation development in the Northeast Coal study area with recommendations for visual resource management in the area. This report was prepared under contract to R. Tetlow and S.R.J. Sheppard (1977).
4. A visual resource assessment of the Northeast Coal Extension Area (Horner, 1982). This report utilizes a system of visual units based on the work of Tetlow and Sheppard but modified to accommodate terrain units as outlined in the document "Terrain Classification System" (Resource Analysis Branch, 1977).

Additional Ministry of Environment visual studies include a recreational/visual input to the East Kootenay Windermere/Invermere Resource folio (1981), a visual analysis chapter in the Bowen Island Study (Block, 1978), a visual analysis of the Gulf Islands resource folio (1981), a visual quality analysis of the South Arm, Kootenay Lake (1982), visual sensitivity studies as part of the Slocan Valley Planning Project and a visual vulnerability assessment for the Cranbrook urban suitability study.

The B.C. Parks Branch has also been involved in visual impact evaluation and routinely subjects all proposed park developments to visual analysis. These studies have included Kalamalka Lake, Princess Louisa Inlet, Tribune Bay, (Hornby Island) and most recently (1982) visual impact studies related to the proposed expansions of Western Mines in Strathcona Park.

During the period covered above, the B.C. Forest Service has recognized the importance of visual analysis by assessing logging impacts on the visual resource. Until 1981 this was done largely in a sporadic manner with limited personnel and funding for the number of impacts generated.

[1]Now the Surveys and Resource Mapping Branch, B.C. Ministry of Environment.

Although no concise records are available covering visual studies carried out by the private sector in British Columbia since 1974, they increased following publication of the Guidelines for Linear Development (ELUC, 1977) and Guidelines for Coal Development (ELUC, 1976). These documents set forth generalized provincial government approval requirements for protection of the visual resource in project proposals related to linear development, e.g. pipelines, utility transmission corridors, and roads related to coal exploration and extraction. Recent examples include visual impact assessments of the proposed Site C and Stikine impoundments (1982 and continuing) where simulation techniques (see Chapter IV) have been employed.

FIGURE 1.1 Visual Resource Assessments, Ministry of Environment: 1974-82.

However, the above studies lacked a concise guideline framework for assessing British Columbia's visual resource base in a systematic manner. Toward this end the B.C. Forest Service took the initiative and in May, 1981, published the "Forest Landscape Handbook". As a field manual, this document clearly advocated the initiation of visual management by government in British Columbia.

Procedures contained in this User Guide are no intended to duplicate those outlined in the Handbook, although similar concepts are discussed in Chapter Two. The two documents should be complementary; the handbook dealing with a specific agency mandate (to manage forest harvesting with full consideration of its visual impact) and the User Guide being concerned with impacts resulting from linear developments, urbanization and - in general - the maintenance of visual quality throughout the province, with particular emphasis on Crown lands.

1.2 USER GUIDE APPLICATIONS AND OBJECTIVES

The User Guide can be applied in four basic ways: as a working methodology, as an adjunct to the provincial "Guidelines to Linear Development" (ELUC, 1977), as a reference document and lastly as a stimulus to standardization of basic visual resource assessment terminology.

1.2.1 USE OF THE GUIDE AS A WORKING METHODOLOGY

While individuals or agencies are encouraged to follow the assessment sequence outlined in the User Guide, applications may vary with each specific project. For example, public involvement may be minimal in park-site visual assessments but of particular importance in utility corridor selections. The User Guide should serve as a matrix for general methodology application but be flexible enough to accommodate projects of varying scale and magnitude requiring their own particular design solutions.

1.2.2 USE OF THE GUIDE AS AN ADJUNCT TO PROVINCIAL GUIDELINES FOR DEVELOPMENT

The User Guide is intended to supplement Provincial assessment guidelines, particularly Section 1.2 of the Guidelines for Linear Development, which deals with aesthetics and visual quality requirements in very generalized terms (ELUC, 1977). It identifies the following major concerns where proponents of development must include these requirements in their design staging:

- distribution of scenic values and landscape quality
- ability of landscapes to absorb visual impacts
- magnitude and importance of visual impact of proposed developments;
- identification of visually sensitive locations
- prediction of adverse visual impacts
- possible mitigation measures to enhance quality
- rehabilitation measures necessary to restore visual quality in the landscape
- existing and potential viewing possibilities and opportunities for view enhancement

1.2.3 USE OF THE GUIDE AS A REFERENCE DOCUMENT

The Appendices to this document are designed to stimulate further investigations of visual assessment techniques in use elsewhere in Canada and abroad, while the Glossary has been expanded to include visual assessment terminology beyond that necessarily contained in the working document.

1.2.4 USE OF THE GUIDE AS A STIMULUS TO STANDARDIZATION OF BASIC VISUAL ASSESSMENT TERMINOLOGY

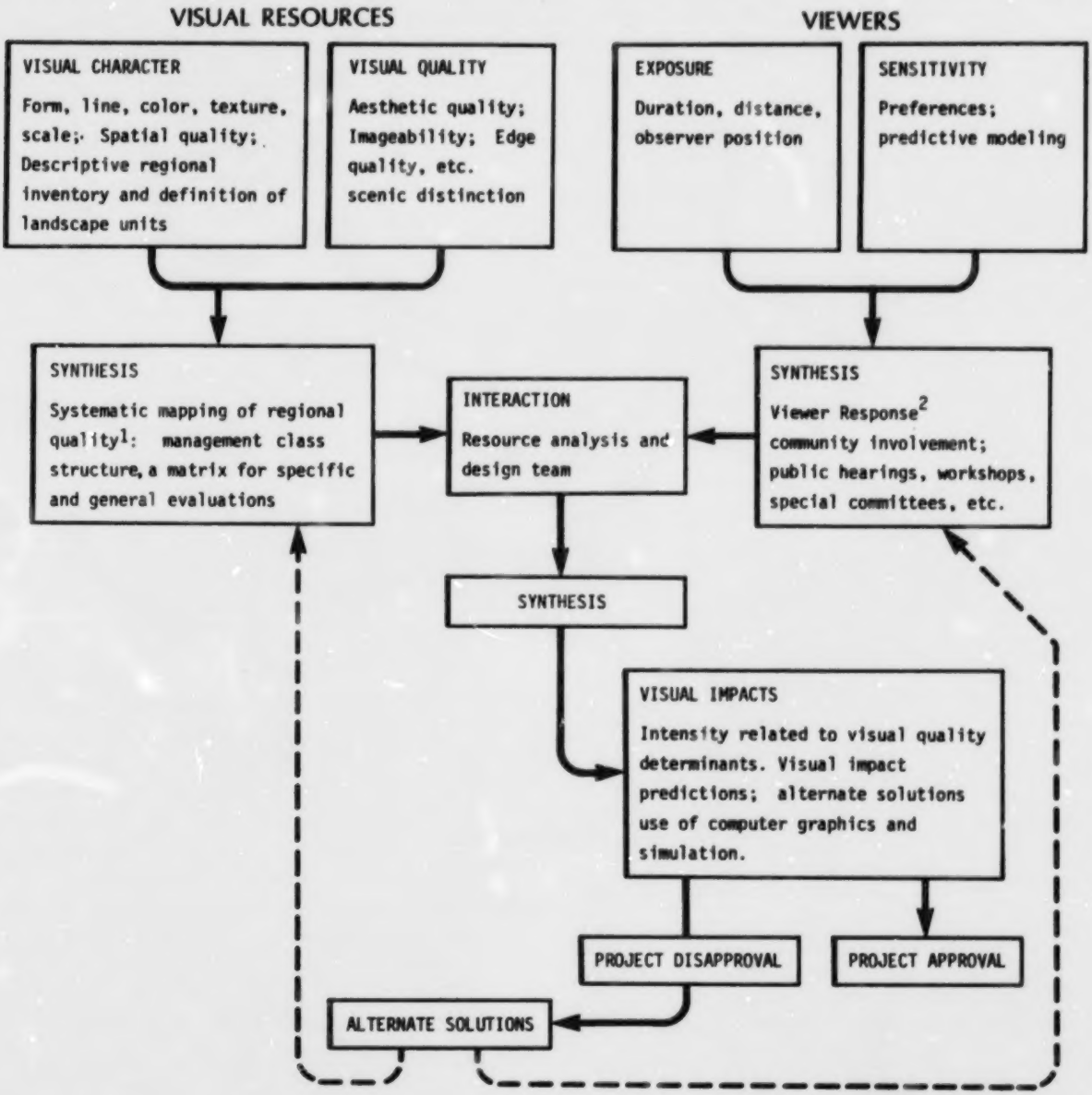
There is a need in British Columbia to standardize and simplify terminology used in the growing field of visual resource analysis. Planners and designers can employ the User Guide as a foundation for further refinement of the art based on a common acceptance of assessment terminology. Other means such as workshops, data exchange between professionals and a centralized library should also stimulate increased information exchanges between practitioners.

1.3 METHODOLOGY AND CHAPTER SUMMARY

Visual analysis is a relatively recent design science and as such requires a more than cursory clarification of terminology used in its conduct if it is to be properly understood. Chapter Two, "Concepts", deals in some depth with such terminology as it is applied to visual inventory and assessment. Familiarity with these basic concepts is essential to the visual analyst as a guide to understanding the basic pattern elements of form, line, colour, texture and their scale relationships as they are perceived in the landscape and as they affect, or are affected by, management activities and cultural changes.

Chapter Three "Descriptive Inventory: Establishing a Regional Framework", outlines a recommended procedure for carrying out the descriptive inventory phase of assessment within a recommended provincial and regional framework. The Chapter defines, in conceptual terms, mapping units suitable for documentation of landform, vegetation, water, focal attractions and cultural modifications. Mapping examples are provided to illustrate each phase of the inventory and a checklist is given covering recommended inventory procedures to be followed.

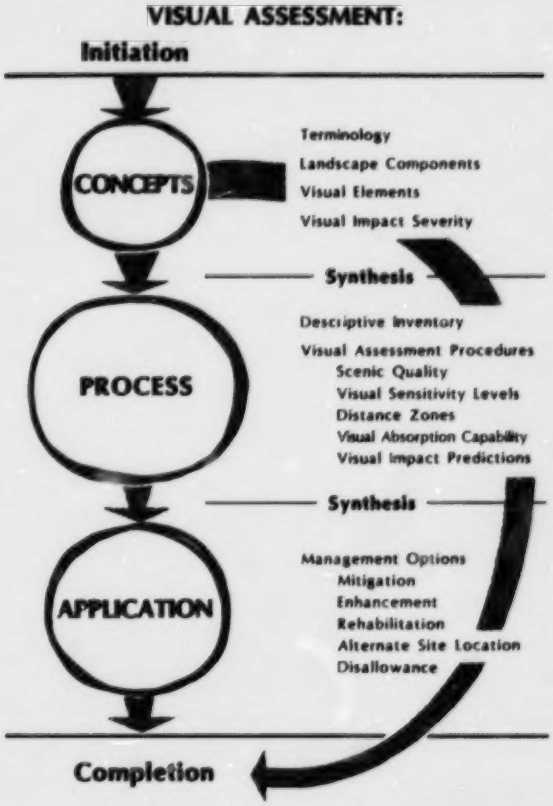
Chapter Four, "Visual Assessment Procedures" is the basic procedural core of the User Guide. It utilizes concepts outlined in Chapter Two, builds upon the descriptive inventory, in Chapter Three and outlines a recommended methodology for determing scenic quality, sensitivity levels and distance zones within any inventories area. These assessments lead to the establishment of Visual Resource Management Classes (VRMC) which can become tools for quantifying visual quality ratings and guiding managers in their determination of land


VISUAL RESOURCES
VIEWERS
VISUAL CHARACTER
Form, line, color, texture, scale; Spatial quality; Descriptive regional inventory and definition of landscape units
VISUAL QUALITY
Aesthetic quality; Imageability; Edge quality, etc. scenic distinction
EXPOSURE
Duration, distance, observer position
SENSITIVITY
Preferences; predictive modeling
SYNTHESIS
Systematic mapping of regional quality[1]: management class structure, a matrix for specific and general evaluations
INTERACTION
Resource analysis and design team
SYNTHESIS
Viewer Response[2] community involvement; public hearings, workshops, special committees, etc.
SYNTHESIS
VISUAL IMPACTS
Intensity related to visual quality determinants. Visual impact predictions; alternate solutions use of computer graphics and simulation.
PROJECT DISAPPROVAL
PROJECT APPROVAL
ALTERNATE SOLUTIONS

[1]Areal, lineal visual resource quality mapping precedes specific impact analysis.

[2]Relates to visual character and quality at site specific, view specific and route specific project.

FIGURE 1.2 A Model for Processing Resource Assessment and Impact Studies



management and allocation priorities. Methods for predicting the degree to which specific developments may alter the visual environment are set forth under Sectin 4.6 "Visual Impact Predictions".

Chapter Five, "Management Options", concludes the User Guide by recommending design guidelines to be followed in accommodating development proposals in the landscape with a minimal impact upon its visual quality. Five alternatives available in this direction are proposed: mitigation, enhancement, rehabilitation, alternate site locations and, finally, disallowance of the project under certain circumstances.

"What is most important about landscapes is their "specialness" rather than their generalized qualities - something they can't experience in other places" (Andrews, 1978).

Chapter Separator Photo

PLATE 2.1 Old pilings and mist enshrouded hills are softly reflected in this B.C. coastal scene. (B.C. Ministry of Environment photo)

2 CONCEPTS

An awareness of concepts, principles and visual resource terminology is essential to the visual analyst if he is to make the best use of the User Guide. Chapter Two deals in some detail with these factors. They will be used throughout the balance of the User Guide in all inventory and assessment methodologies proposed. They are also intended as a procedural framework for future visual resource mapping in British Columbia.

Sections 2.1 through 2.3 draw upon the BLM system with little modification.[1]

2.1 BASIC TERMINOLOGY

The following thirteen basic terms are key to an understanding of visual resource inventory and assessment[1]:

1. Form - the mass or shape of an object, which appears unified; often defined by edge, outline, and surrounding space.
2. Line - the path the eye follows when perceiving abrupt differences in form, colour, or texture. In the landscape, ridges, skylines, structure, changes in vegetation, or individual trees and branches may be perceived as line.
3. Colour - the property of reflecting light of a particular intensity and wavelength that enables the eye to differentiate otherwise indistinguishable objects.
4. Texture- the visual manifestation of the interplay of light and shadow created

[1] United States Dept. of Interior, Bureau of Land Management (1980) as modified by Smardon, Sheppard, et al., under title of a "Prototype Visual Impact Assessment Manual" (1982).

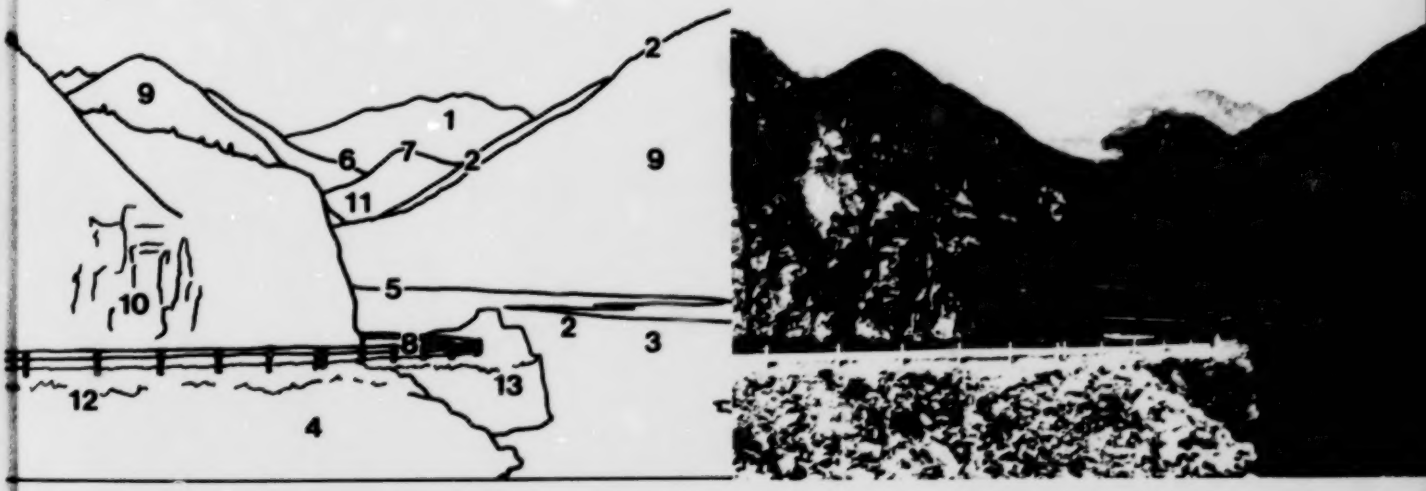


PLATE 2.2 An illustration of basic visual design terminology in graphic terms as outlined in Section 2.1 of the text.

by variations in the surface of an object.

5. Scale - the proportionate size relationship between an object and the surroundings in which it is placed.
6. Space - the three dimensional surroundings in which it is placed.
7. Harmony- the combination of parts into a pleasing or orderly whole; congruity; a state of agreement or proportionate arrangement of form, line, color, and texture.
8. Cultural Modification- any man-made change in land, waterform or vegetation (roads, bridges, buildings, fences); the addition of a structure which creates a visual contrast to the natural character of a landscape. A negative cultural modification is disharmonious with the existing scenery. A positive cultural modification can actually complement and improve a particular scene by adding variety and harmony.
9. Contrast- the effect of a striking difference in form, line, color, or texture of a landscape's features.
10. Variety- the condition of having differentiated parts; the absence of monotony or sameness.
11. Back Lighting - where the light source comes from behind the object viewed. The visible face of the object is generally in shadow and its edge highlighted.
12. Front Lighting - where the light source comes from behind the observer and falls directly on the object viewed. There is little shadow effect.
13. Side Lighting - where the light source comes from one side of the object viewed. This is the light considered most effective for evaluating visual contrast.

2.2 LANDSCAPE COMPONENTS

Any landscape[2] can be described in terms of its physical parts. These are:

a) Landform e.g. types of land surfaces: plateaus, mountains, valleys etc. See Appendix A, Glossary.
b) Landcover
   1) Rock and soil surfaces
   2) Lakes, water courses, marshes
   3) Ice and snow.
   4) Vegetation - trees, shrubs, and low vegetation perceived not as three-dimensional objects in foreground nor as two-dimensional objects in foreground but as two dimensional patterns over longer viewing distances.
   5) Structures - man-made objects in the landscape; usually three-dimensional (e.g. buildings, transmission towers, irrigation channels), but sometimes low-profile and two-dimensional (e.g. roads).

Management activities introduce or modify one or more of the above landscape components.

2.3 VISUAL ELEMENTS

Any landscape or component of the landscape has the following visual characteristics or basic elements:

- colour
- form
- line
- texture
- scale
- spatial character

The following concepts are important in describing any of the visual elements:

a) Visual Compatibility

The visual elements are the source of visual compability in the landscape, creating the patterns that we see. An object may differ from its setting or other objects in one or more element.

---

[2] A portion of the land the eye can see in one glance: See Glossary.

Pattern consists of an arrangement of parts that suggest a design or distinct distribution.

The pattern of any element may be described in terms of its:

complexity - the intricacy or simplicity of arrangement of parts.
diversity - the number and variety of parts making up the pattern.

b) Visual Dominance

The visual elements also help determine the degree of visual dominance of an object over its setting or other objects. Where there is significant contrast in one or more of the elements, one object may dominate other parts of the landscape, e.g. form over colour, line over texture, etc.

c) Relative Importance of Visual Elements

In any landscape, one or more of the visual elements may be more important than the others. The most important elements in a scene are those which contribute most to its character, due to either 1) high contrast; or 2) extent and uniformity of expression in the scene.

Colour, scale, and spatial character are frequently the most important elements in setting the character of landscapes or dictating the compatibiltiy of landscape modifications. However, different elements tend to be important in different regional landscapes and in different viewing conditions.

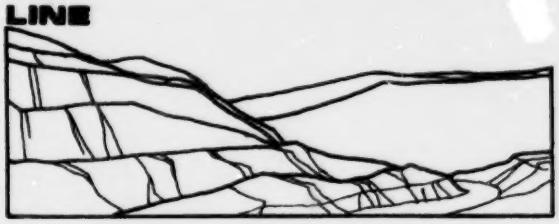
2.3.1 COLOUR

Definition (See 2.1)

Sub-elements

COLOUR

LINE



SCALE

FORM

TEXTURE

SPATIAL CHARACTER

Hue - the aspect of colour which we know by particular names, e.g. red, blue, orange, and which forms the visible spectrum. A given hue or colour tint is caused by a particular wavelength.

Value - the degree of lightness or darkness, caused by the intensity of light being reflected, ranging from black to white.

Chroma - the degree of colour saturation or brilliance, determined by the mixture of light rays. It is the degree of grayness in a colour, ranging from pure (high chroma) to dull (low chroma).

Dominance

With other things equal, light, warm, bright colours in a scene will "advance" and tend to dominate dark, cool, dull colours which "retreat". Dark next to light tends to attract the eye and become a visual focal point.

Variable Effects

Distance - As viewing distance increases, atmospheric perspective, due to scattering of light by dust particles, makes

Distance

colours become paler, lower in chroma, and bluer. High value colours tend to remain most recognizable over great distances.

Atmospheric Conditions - haze, fog, dust, rain, etc. may cause atmospheric perspec-

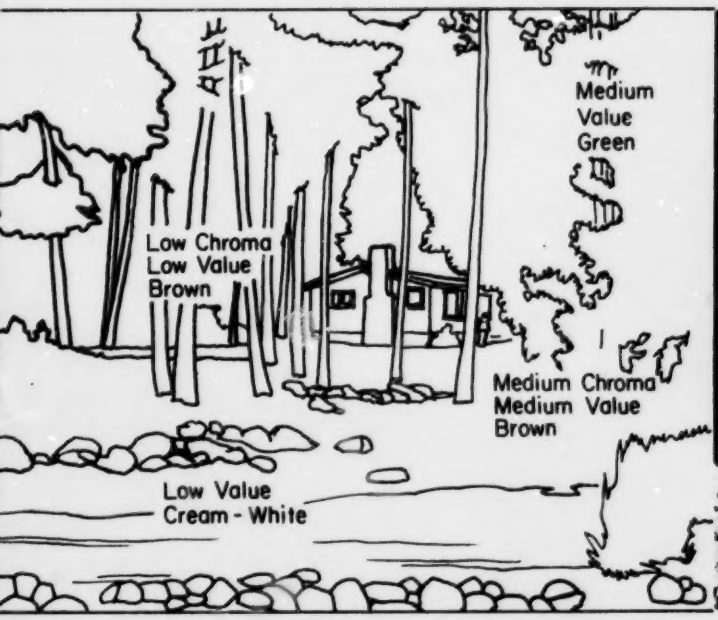
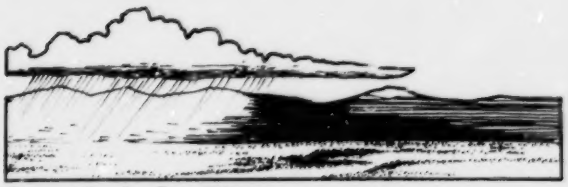


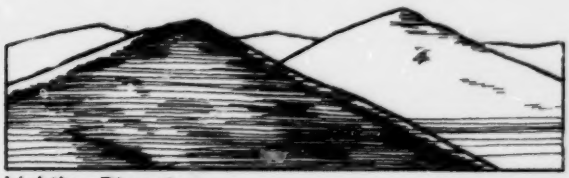
PLATE 2.3 The major colours in this Kootenay Lake cottage scene are brown (structure), green (trees), yellow (ground cover) and cream to white (rock and road). The cottage fits the site well, contrasting little with its surroundings



Atmospheric Conditions

tive to become extreme even over short viewing distances. Cloud reduces value and chroma.

Lighting Direction - objects which are illuminated from the front, appear paler



Lighting Direction

and brighter than those which are illuminated from behind

Time of Day - illuminated surfaces tend to become paler during periods of midday sun, otherwise becoming darker and redder later in the day.

2.3.2 FORM

Definition (See 2.1)

Types

2-Dimensional shape - the presence of an area or areas which contrast in colour and/or texture from adjacent areas creates a two-dimensional shape in the landscape.

3-Dimensional Mass - the volume of a landform, natural object or man-made structure in the landscape.

Sub-Elements: Definitions

Geometry - the extent to which a form approaches a standard geometrical figure

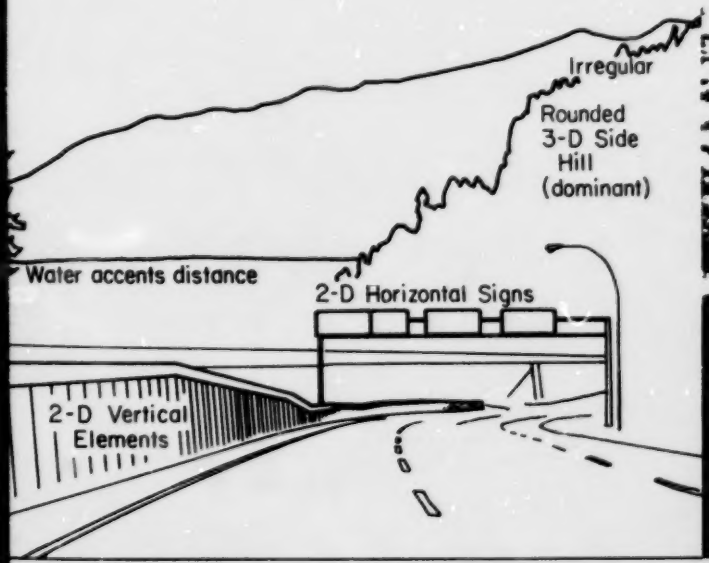
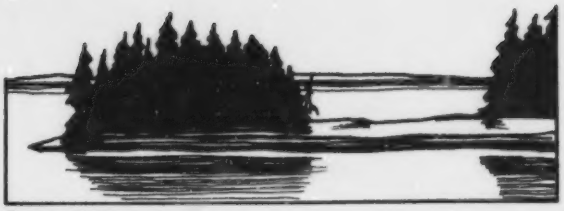


PLATE 2.4 The major dimensional forms in this landscape consist of a dominant forested shoulder and ridges beyond. The lineal 2-D entrance sign markers contrast strongly with their background, becoming highly legible. The roadway form implies "entry downward" and blends with the lower edge of the landform on the right of the photograph



Geometry

of 2 or 3 dimensions, e.g. square, circle, triangle, cube, sphere, cone, etc.

Complexity - the degree of simplicity or

Complexity

intricacy of a form; simpler forms tend to be regular; complex forms irregular.

Orientation - the relationship of the form to the horizontal axis of the landscape

Orientation

e.g., vertical, horizontal, diagonal, non-directional, or to the points of the compass.

Dominance

Forms that are bold, regular, solid or vertical tend to be dominant in the landscape.

Variable Effects

Viewing Angle - the visual proportions of forms change with the direction and angle of viewing, known as "perspective effects". Two-dimensional forms become foreshortened from lower observer positions and oblique viewing angles. Three-dimensional forms appear to diminish towards the horizon, especially with oblique viewing angles.

Lighting - frontlighting and backlighting tend to flatten three-dimensional forms. Backlighting may emphasize two-dimensional silhouettes. Sidelighting enhances three-dimensional effect.

Movement - the eye is attracted to movement in the landscape, e.g. changing forms such as waterfalls, or smoke plumes.

2.3.3 LINE

Definition (See 2.1)

Types

Edge - the boundary along which two contrasting areas are related and joined together--the outline of a 2-dimensional shape on the land surface.

Band - contrasting linear form with 2 roughly parallel edges bisecting an area.

Silhouette-line - the outline of a mass seen against a backdrop. The skyline is the silhouette-line of the land against the sky.

Sub-Elements

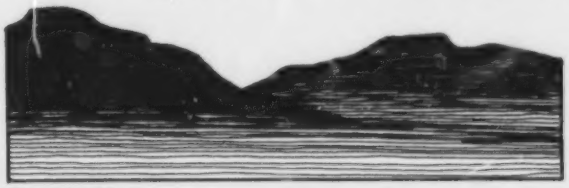
Boldness - the visual strength of a line. Smooth, long and sweeping lines are stronger than lines formed by the over-

Boldness

lapping of numerous forms, such as treetops. Edges between strongly contrasting colours - skylines for

example - are bolder than those between similar colours.

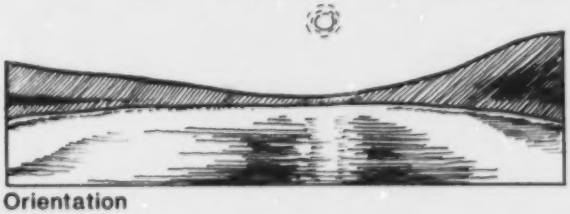
Complexity - the degree of simplicity or intricacy of a line, determined by the



Complexity

variety of directions it follows. Skylines in rugged terrain are more complex than on flat plains.

Orientation - the overall relationship of the line to the horizontal axis of the landscape or to compass bearings.



Orientation

Dominance

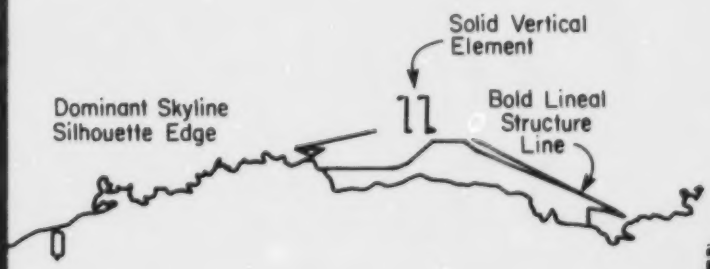
Bold vertical lines which interrupt the skyline tend to dominate weak horizontal lines.

Variable Effects

Distance - the strength of a line can decrease with distance due to atmospheric haze.

Atmospheric conditions - clouds, fog, haze, snow can obliterate skylines.

Lighting - frontlighting flattens form and reduces line strength so that often only the skyline remains evident (e.g. mountain ranges). Sidelighting accentuates the silhouette-lines of separate forms. Backlighting blends forms of equal distance into one outline. In mountain ranges, ridgelines delineate overlapping flat silhouettes.



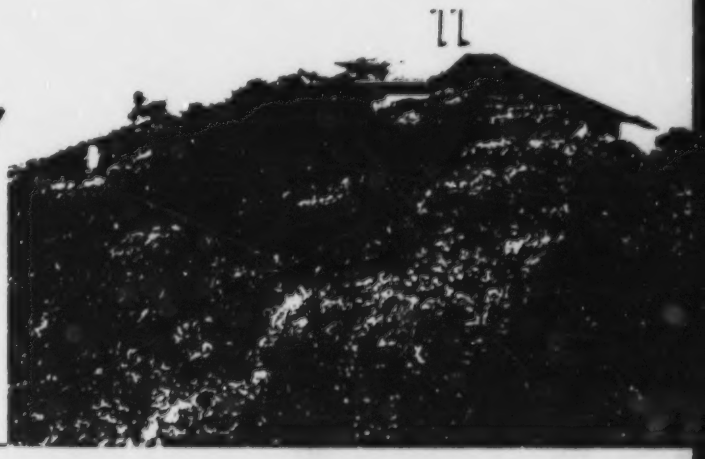


PLATE 2.5 This scene illustrates how well line, in this case a house roof line, can blend or harmonize with a dominate skyline silhouette edge to become an integal part of the natural landscape, offering little contrast. The vertical chimney line is subordinate to the roof line, creating visual interest

2.3.4 TEXTURE

Definition (See 2.1)

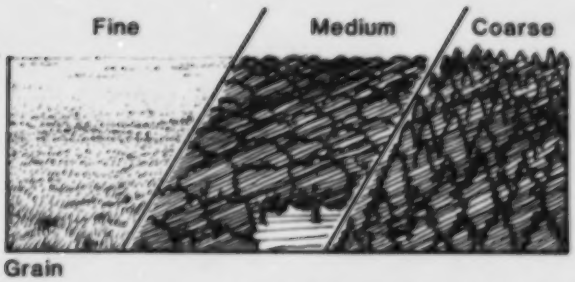
Type

Colour Mixture (mottling) - intrinsic surface colour contrasts of very small scale in relation to the perceived mass may be due to hue, chroma or value, alone or in combination.

Light and Shade - the colour contrast, particularly in value, created by differences in lighting on a varied surface or by repeated forms. Texture is the result of the repetition of a lit side, a shaded side, and shadow cast by the element.

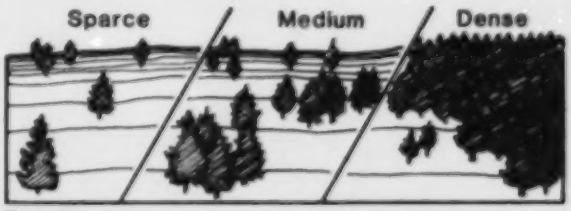
Sub-Elements

Grain - the relative dimensions of the surface variations, ranging from large grain or coarse textures, e.g., coniferous forest to small grain fine texture, e.g., grasslands.



Grain

Density - the spacing of surface variations creating the texture.



Density

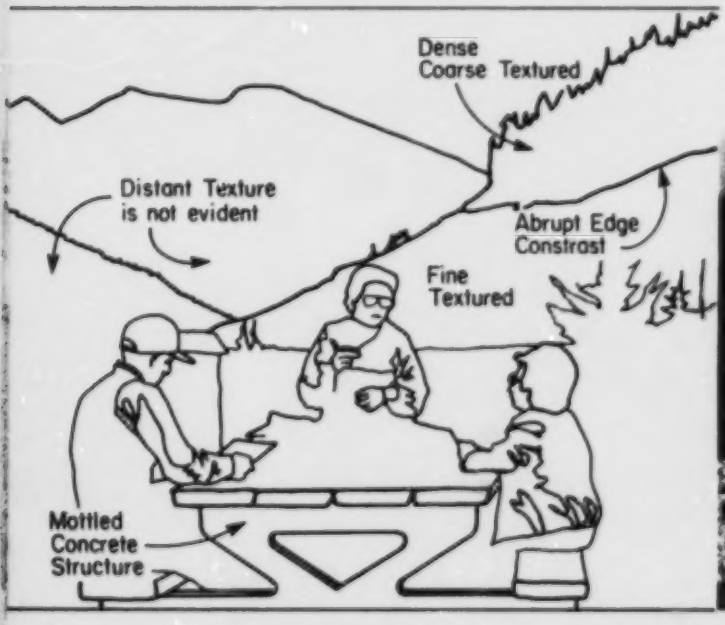


PLATE 2.6 A variety of textures in this B.C. pinic scene occur with little semblence of harmony. The course textured, dense forest cover is broken by a fine textured, even/ordered clear-cut in the foreground. The scene is somewhat redeemed by a distant panoramic view where texture is not discernable

Internal Contrast - the degree of contrast in colours or values creating the texture.

Dominance

Coarse and contrasty textures tend to dominate fine-grained textures of low internal contrast.

Variable Effects

Distance - internal contrast and the apparent grain of the texture is lessened with distance. Coarse textures of coniferous forest may remain visible at up to 12-15 kms, while fine textures of grassland may disappear within 1/2 km of the observer.

Atmospheric Conditions - haze, cloud, dust, etc. reduce the distances at which textures disappear and lose internal contrast.

Illumination - light and shade textures are most obvious in side-lighting and when light intensity is strong, casting distinct dark shadows. Strong side-lighting increases distance-range within which textures remain visible.

2.3.5 SCALE

Definition (See 2.1)

Types

Absolute Scale - the absolute size of an object obtained by relating the size of the object to a definitely designated (i.e., measured) standard.

Relative Scale - the relative size of objects; the apparent size relationship between landscape components and their surroundings.

PLATE 2.7 This scene illustrates the spatial qualities of a focal landscape readily seen from a key observation point (KOP) along a major highway in the Okanagan area. Any management activity at point "A" would be highly visible. In this example, atmospheric clarity and elevation of the observer combine to lead the eye directly to point "A"

Sub-Elements

Scale dominance - the scale of an object relative to the visible expanse of the landscape which forms its setting.

Scale contrast - the scale of an object relative to other distinct objects or areas in the landscape.

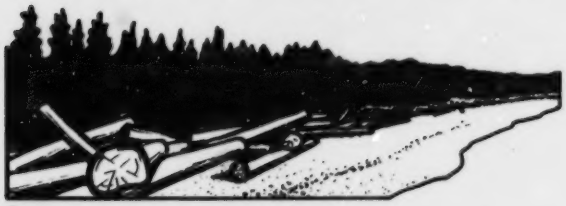
Proportion of field-of-view - the scale of an object relative to the total field-of-view accepted by the human eye or camera.

Dominance

Large, heavy, massive objects within a confined space dominate small, light, delicate objects in more expansive settings.

Variable Effects

Distance - the apparent size of an object



Distance

decreases with distances from the observer.

Spatial enclosure - the size of the enclosing space inversely affects an object's

Spatial Enclosure

relative scale: small spaces make objects appear larger.

Viewing Angle - the apparent scale of an object in the landscape is affected by the observer's angle of view in two ways:

1) perspective foreshortening when seen obliquely or at low viewing angles reduces the apparent size of surfaces of areas or objects.

Viewing Angle

2) by increasing an object's elevation in relation to the observer's position, the object's relative scale tends to increase.

Atmospheric Conditions - increased haziness may increase the apparent scale of the

Atmospheric Conditions

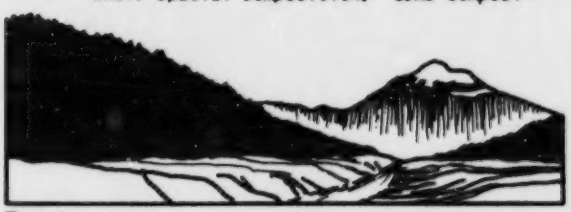
landscape's space by obscuring its boundaries.

2.3.6 SPACE

Definition (See 2.1)

Sub-elements

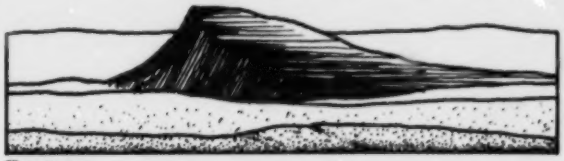
"Landscape Composition" is defined as the arrangement of objects and voids in the landscape that can be categorized by their spatial composition. Some composi-



Focal

Canopied

tions, especially those which are distinctly focal, enclosed, or feature-oriented, are more vulnerable to modifi-

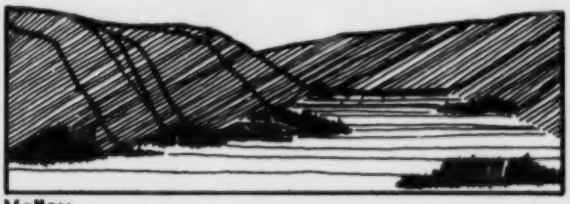


Feature

cations than others, depending upon how strongly the spatial configuration draws the eye to certain locations.

Spatial Position - the elevation and location

Plain



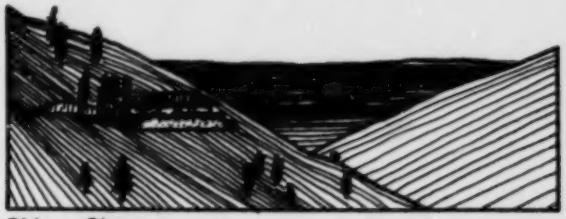
Valley

of objects in the landscape relative to topography affect their prominence: high and exposed positions are more prominent than low obscured positions.

Dominance

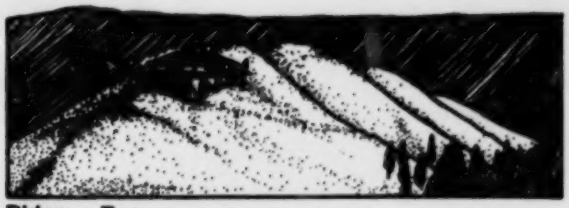
Objects which occupy vulnerable positions within spatial compositions, which are high in the landscape, and/or which are seen against the sky dominate in the scene.

Toe - Slope



Side - Slope

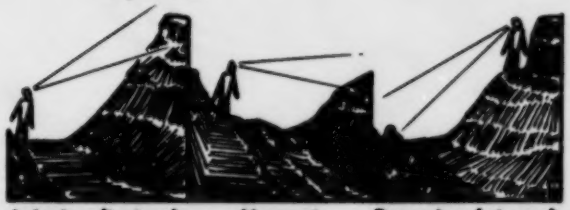
Plateau - Bench



Ridge - Top

Variable Effects

Observer Position - the position of the observer relative to the landscape may be described as: inferior, normal and superior.



Inferior (below) Normal Superior (above)

A change in position can affect the observer's perceptions of degree of enclosure and an object's degree of spatial dominance. Inferior positions may increase both apparent degree of enclosure and spatial dominance.

Distance - the observer's proximity to elements will affect perception of their spatial importance. Longer viewing distances tend to reduce the impression of spatial enclosure and dominance.

2.4 VISUAL IMPACT SEVERITY

The severity of visual impact of a management activity depends upon:

1) visual contrast of its elements, especially in colour, form, line, and sometimes texture.
2) visual dominance of its elements, especially in scale and spatial position.
3) relative importance of its elements. Severe impacts may occur where important elements are altered or where a new important element is added.

PLATE 2.8 Strong visual contrasts in form, line, colour and texture are provided by this roadside advertising billboard. The scale of the billboard dominates its surroundings, a factor highlighted by its location in an enclosed landscape where automobile wreckage and debris draw attention to the billboard and increase its visual impact severity

2.5 THE COGNITIVE PROCESS

Figure 2.1 illustrates the inter-relationships existing between principles and concepts outlined in this chapter. It is designed to aid the visual analyses in applying visual element terminology (form, line, colour, texture and scale) to descriptive inventory and visual assessment procedures as prescribed in Chapters Three and Four. See also Appendix B "User Reference Factors".

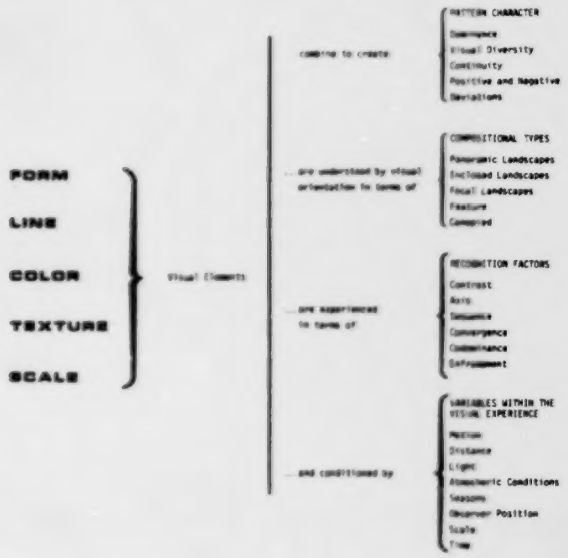


FIGURE 2.1 The Cognitive Process

HAP
3

"Landscapes provide a record of the earth's history that is important to a geologist or geomorphologist, but the same record may be read by an observant traveler. If he so wishes, his enjoyment of scenery and of general travel may be considerably enhanced through an understanding of the origins and development of landforms" (Holland, 1964).

Chapter Separator Photo

PLATE 3.1 Abundant water in British Columbia offers visual diversity throughout the seasons

3 DESCRIPTIVE INVENTORY : Establishing a Regional Framework

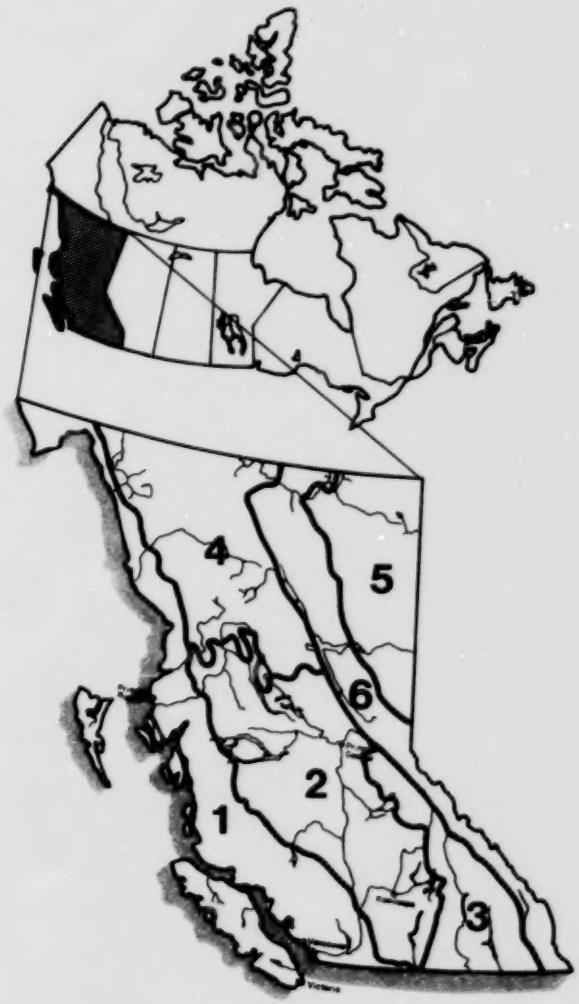
3.1 HOLLAND'S PHYSIOGRAPHIC REGIONS

A descriptive inventory of visual resources is necessary to document landscape components (land, water, vegetation and structures) for subsequent assessment as outlined in Chapter Four. The descriptive inventory is a rational documentation of observed landscapes (Litton, 1979) and should be kept as objective as possible.

In order to bring British Columbia's regional landscape into visual perspective for inventory purposes, Landforms of British Columbia (Holland, 1964) has been adopted as a basic framework (Figure 3.1).

Physiographic regions are areas in which there are 1) similar processes of erosion and deposition; 2) similarities of bedrock response to erosion and 3) similarities of orogenic history. They generally cover too large an area to be directly perceived visually unless from a high flying aircraft or seen in a day's travel time.

PLATE 3.2 The Rocky Mountain Trench is a narrow but well defined physiographic region in British Columbia



The Coast Mountains and Islands	1
The Interior Plateau	2
The Columbia Mountains	3
The Northern and Central Plateaus and Mountains	4
The Great Plains	5
The Rocky Mountain Area	6

FIGURE 3.1 The Physiographic Regions of British Columbia. (Source, Holland, 1964)

3.2 THE BIOTIC REGIONS OF BRITISH COLUMBIA

A more precise definition of landform and landcover within the physiographic region is required in the visual assessment process. The Biotic Regions and Sub-regions of British Columbia (Demarchi, 1983) were selected for this purpose.

Although the eighteen biotic regions (Figure 3.2) are largely based on generalized climatic characteristics and topography, the 52 sub-regions more directly reflect discrete parameters in terms of elevational changes, vegetation, temperature and precipitation variations and wildlife habitat. They therefore appear to be a suitable framework

Biotic Regions of British Columbia

Legend

Regional Boundary

Subregional Boundary (VRMA)

First Approximation December 1981

Source: Dennis Demarchi, Ministry of Environment, Victoria, British Columbia, 1983.

FIGURE 3.2 The Biotic Regions of British Columbia

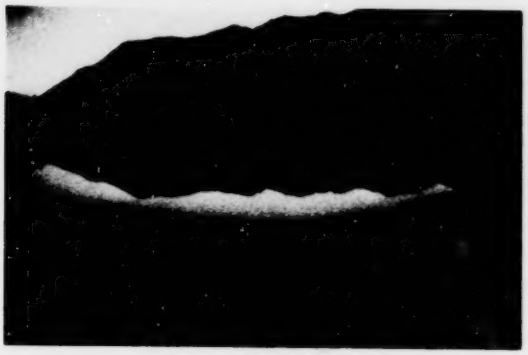


PLATE 3.3 The Georgia Depression Biotic Region is rich in imagery and visual variety

for establishing a recommended system of visual resource management areas.

PLATE 3.4 The Northern Rocky Mountains Biotic Region is characterized by dramatic vistas and deeply forested valleys

3.3 THE VISUAL RESOURCE MANAGEMENT AREA (VRMA)

A system of classifying visual resource values is needed on all Crown Land in British Columbia that will allow systematic visual resource mapping of the entire land base regardless of ownership or administration, much as soils, terrain, climate and other biophysical mapping is now carried out in

FIGURE 3.3 Slocan Valley in Relation to Biotic Region 14

the U.S. and Canada. Thus in addition to administrators of Crown Lands, regional planners concerned with urban fringe areas, agricultural lands, private lands and institutional properties could profit from visual resources inventories that would lead to management decisions reflecting aesthetic as well as economic and social factors.

In order to accomplish the above objective, a system of sub-regional mapping is needed that will not only reflect indigenous regional characteristics but also relate to physiographic regions, to the Province as a whole and even to contiguous provinces and states in the U.S. These units will be referred to in the User Guide as Visual Resource Management Areas (VRMA).

PLATE 3.5 Whycliffe Prairie is a central part of VRMA 15-A (Southern Rocky Mountain Trench Biotic Sub-region)

The VRMA is defined as a management unit within which visual resources can be mapped in terms of landform and landcover (vegetation, water and land use) in the degree to which these factors relate to scenic quality, visual sensitivity to development and, subsequently, to visual resource management classes (Chapter IV).

The four mapping sub-units within the Columbia Mountains and Highlands Biotic Region (Figure 3.3, #14) reflect subtle but importnt differences in precipitation, temperature, climatic processes, topography and vegetation. These become significant parameters for defining visual values within each sub-region, or VRMA. This principle would apply to all other sub-regions or Visual Resource Management Areas throughout the Province.

3.4 THE LANDSCAPE UNIT

Within each VRMA, landscape units can generally be identified. These are basic mapping units commonly defined as areas or volumes of distinct character.

Although they usually fall within the VRMA, they may in some instances embrace more than the VRMA, e.g. the Rocky Mountain Trench, which extends through three VRMAs in Biotic Region #16 or the Great Plains Physiographic Region, where landscape units cover large areas having indistinct boundaries.

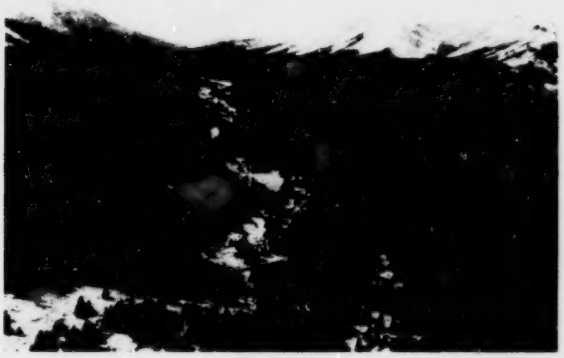


PLATE 3.6 This landscape unit in Northeastern B.C. is a visually distinct area with strong topographic definition

Climate can also be a factor in landscape unit definition by virtue of its effect upon vegetation changes.

The landscape unit can be thought of as an outdoor room with floor and walls. It involves

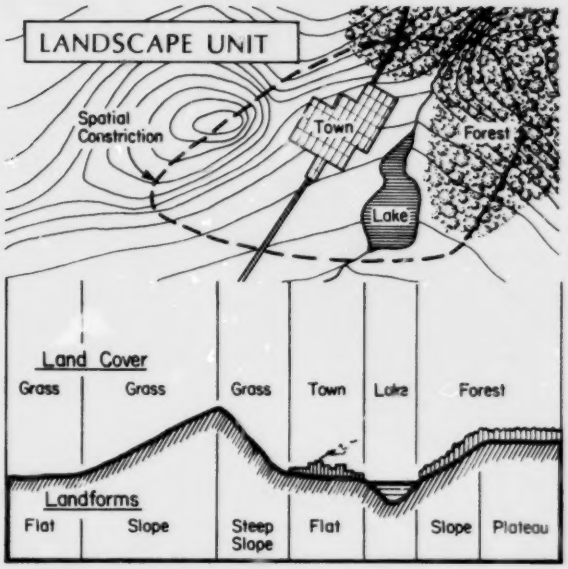


FIGURE 3.4 The Landscape Unit (After Jones and Jones, 1977)

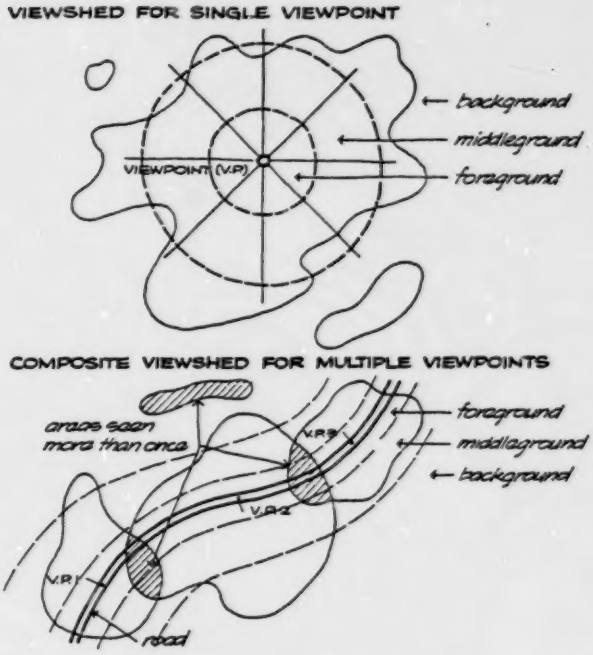


FIGURE 3.5 Viewshed Mapping (Jones and Jones, 1977)

boundary definitions, some of which may not be topographic but could possibly be farmland edges, fire breaks, reservoir draw-down lines and other separations between altered and unaltered landscapes conditions. However, the landscape unit is mainly identified by its distinctiveness, regardless of mapping scale (See Tetlow and Sheppard, 1977 for landscape unit assessments in undeveloped areas with extreme topography and Jones and Jones, 1977 for examples in more subdued and urbanized environments). See also Figure 3.4.

3.5 THE VIEWSHED

Within the VRMA and/or landscape unit, and at a more detailed level, viewsheds often occur as visual corridors and can be identified as such.

A viewshed is comprised of all surface areas visible from an observers viewpoint and/or surface area or from which a critical object or viewpoint can be seen, i.e., a "seen" or "visible" area (Jones and Jones, 1977). The viewshed thus becomes a means of identifying views or key observation points (KOP) affected by any specific project. If

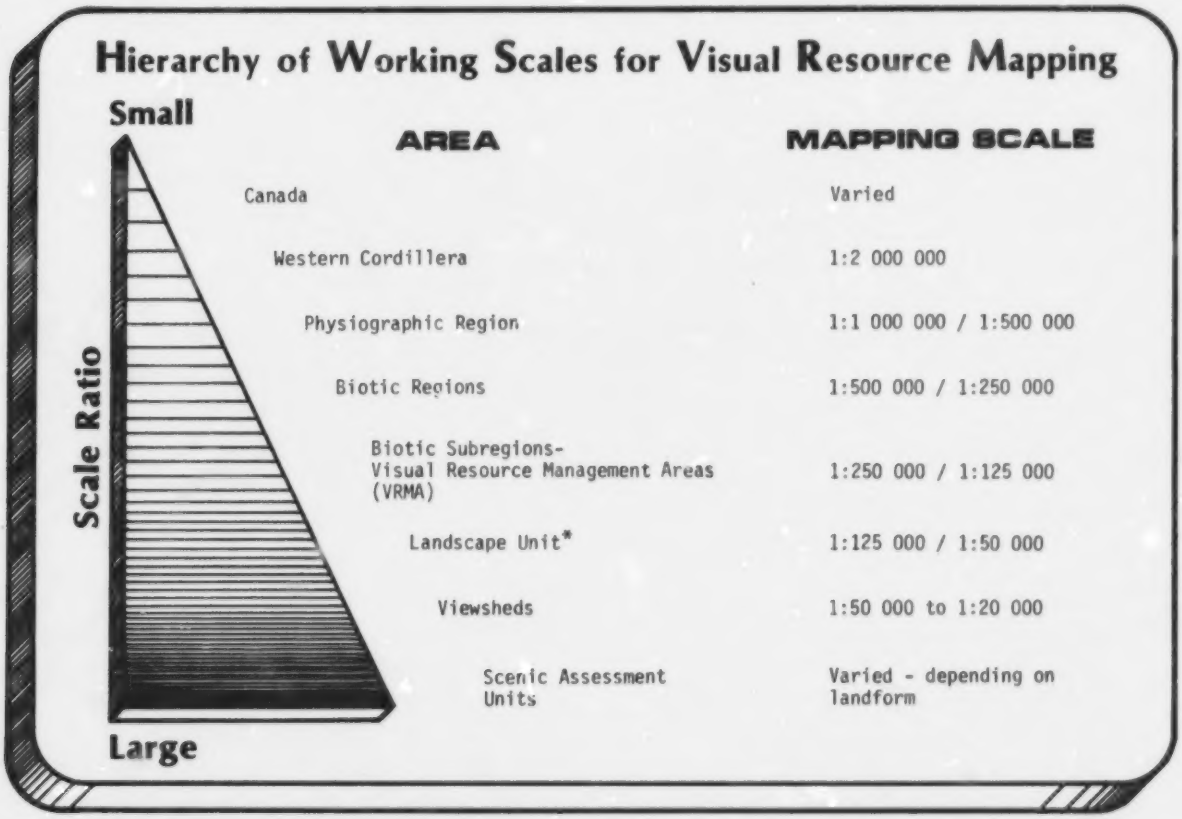
PLATE 3.7 The Summit Lake viewshed north of Slocan Lake is a well defined visual corridor

PLATE 3.8 This scenic assessment unit is characterized by homogenous natural elements

alternate project locations are called for, (see Chapter V, "Management Options") each alternative may have its own viewshed. It can be useful and effective to combine the landscape unit and viewshed where this occurs naturally. Any number of viewsheds can occur in a landscape unit. When these overlap, they are called composite viewsheds (Blair, 1981). For viewshed corridor examples in Canada, see Ontario Ministry of Forests, 1977 and 1980.

3.6 THE SCENIC ASSESSMENT UNIT (SAU)

Graphically illustrating scenic quality within



*NOTE: Scales will vary as one approaches the area under study, depending upon intended level of inventory intensity.

FIGURE 3.6 Hierarchy of Working Scales for Visual Resource Mapping

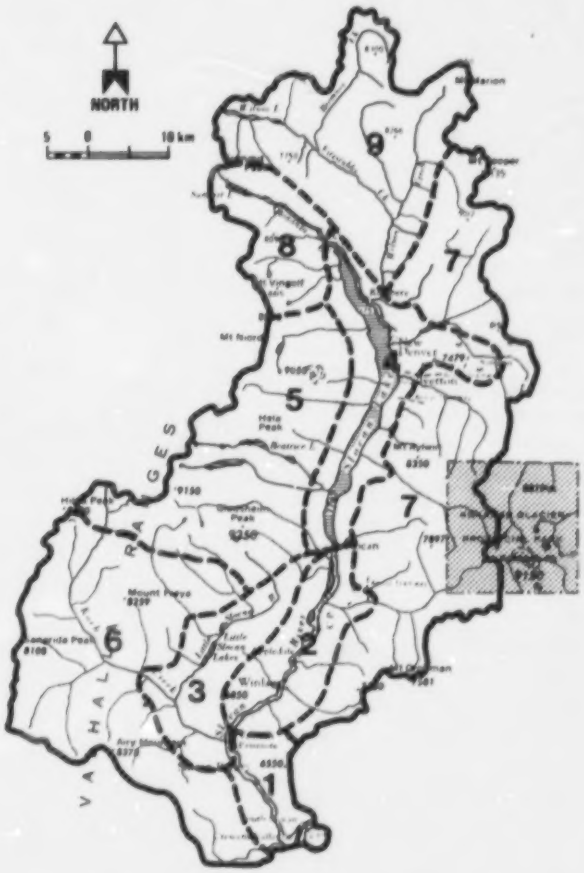
the landscape unit generally requires a discrete mapping subdivision. This is called a Scenic Assessment Unit, or SAU. The SAU can be established within boundaries determined by a single natural element or more often by a combination of natural and man-made components within the landscape. In flat to rolling terrain, where landscape unit boundaries may be indistinct - such as within the Alberta Plateau Biotic Region - the SAU may comprise the entire visual unit or even the VRMA itself. The primary criterion for defining a scenic assessment unit is its homogeneity of landform, vegetation and water. Figure 3.7 is an example of SAU definition based upon a combination of landform, water and road and rail alignments.

3.7 THE SLOCAN VALLEY: A MAPPING EXAMPLE

Inventory varies in intensity within each of the mapping units outlined above. For example, the VRMA would be dealt with in broad terms - usually at the reconnaissance level - while the landscape unit and/or viewshed call for more detailed investigations, description and evaluation since they become mapping sectors where point/view and area visual impacts are most likely to occur.

PLATE 3.9 The Slocan Valley landscape unit looking south toward Frog Peak

For purposes of illustration, the Slocan Valley landscape unit (Figure 3.8) has been high-



Example - not a plan (for illustrative purposes only)

Legend

1 Lower Slocan Valley
2 Lower Slocan - West Perry Ridge
3 Little Slocan Valley - East Perry Ridge
4 Slocan Village to Community of Hills including Sandon Corridor
5 Valhalla Ranges
6 West Slocan Valley Drainage
7 East Slocan Valley Drainage
8 Community of Hills north to Summit Lake
9 Wilson Creek Drainage

FIGURE 3.7 Slocan Valley Scenic Assessment Units (SAU)

lighted to serve as a mapping example of recommended inventory and assessment methodologies outlined in the balance of this Chapter and throughout Chapter IV.

The Slocan Valley landscape unit falls within VRMA 14-R. The unit consists of approximately 314 000 hectares (1,212 sq. mi.) of which 298 000 hectares (1,150 sq. mi.) or 94% are administered by the Crown. The characteristic landscape can be described as forested/rolling to rugged, with steep mountains rising to 2803 metres (9,250 ft.) in the Valhalla ranges along its northeast boundary. Slocan Lake, 23 500 hectares in area (91 sq. mi.) occupies a central portion of its northern extremity and lies at an elevation of 1762'. It is drained southward by the Slocan and Little Slocan Rivers. Valley bottoms and sides hold moderate agricultural value, are sparsely settled and scenic. Timber harvesting and tourism are the unit's primary land use activities. A major highway and rail line dissect the area. Height of

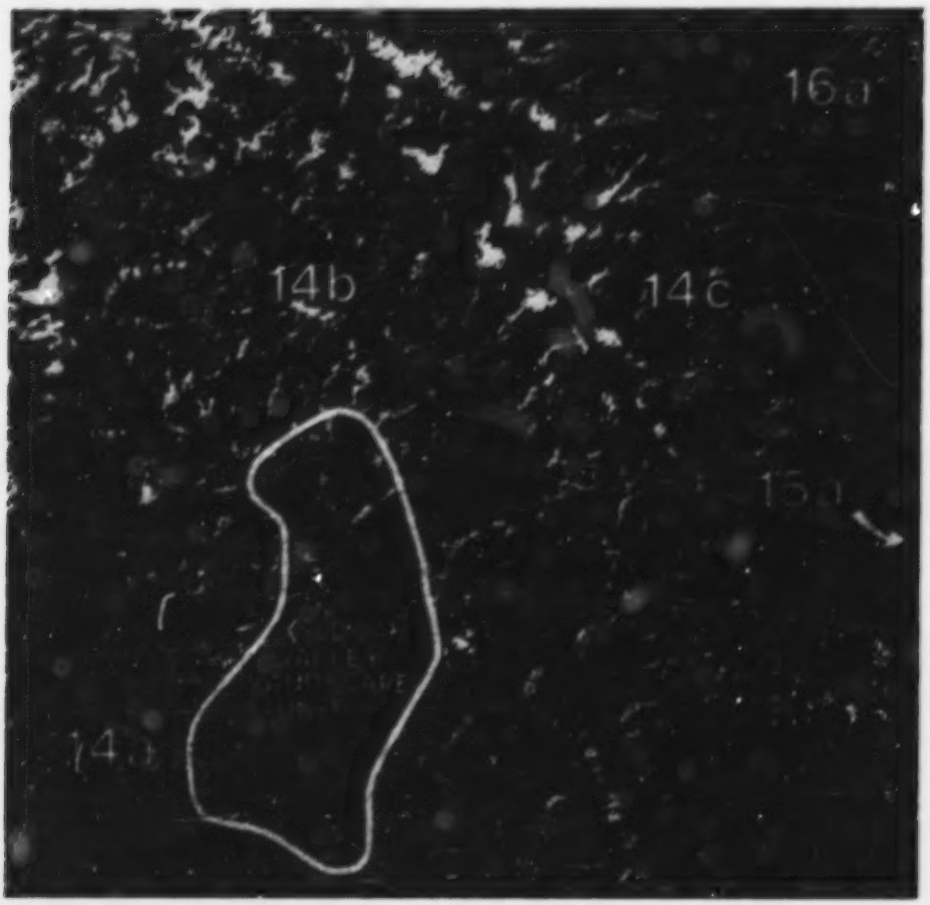


FIGURE 3.8 Slocan Valley Landscape Unit
(Landsat 2 Imagery, October 9, 1980, Canada Centre for Remote Sensing)

PLATE 3.10 The Slocan Valley landscape unit looking north toward Summit Lake

land to west and east, narrowing to portals[1] to the north and south, define the Slocan Valley Landscape Unit.

General Description

"Form: Bold to moderate. Slocan Valley is "form dominant" with peaks rising sharply above valley floor.

Line: Ridge line (Perry's Ridge) a strong element. Bold skyline edges along western and eastern boundaries. Valley edges are digitate where valley meets ridge bottoms.

Colour: Dark, cool colours of forested hills tend to retreat in perspective. Blues of lake and river become foil for greens and yellows along main valley floor.

Scale: Confined along valley floor; massive in Valhalla ranges.

Spatial Complexity: Largely panoramic with some enclosure along river. Valley floor accents this. Portal at south end of lake is a prominent spatial feature.

Texture: Basically coarse textured forested ridges and mountains, dense to medium and patchy in foothills and sparse along valley floor. Some internal deciduous elements contrast with evergreen canopy. Fine textured grasslands flank Slocan River and upper reaches of Little Slocan River; also area north of New Denver.

The Slocan Valley landscape unit is high in imageability and symbolism (See Glossary), primarily within the dramatic Valhalla ranges and throughout its main river valley system, where edge contrasts and agricultural pastoral patterns predominate. A historic theme prevails in the vicinity of New Denver and Sandon where early mining took place. Remnants of this activity remain rich in visual symbolism. The regional theme of this landscape unit is similar to that of the VRMA at large, i.e., "valley-mountain-lake" but at a more personally comprehensive scale than that generally found elsewhere in the VRMA. Atmospheric conditions are periodically affected by sawmill emissions but generally the unit's topographic and water features are clearly visible from key observation points (KOP) along highway route #6, which transects the unit from south to north. Climate of the area is Continental in nature with warm summers and cold winters. Annual precipitation ranges from 560 mm (22 in.) in some valley bottoms to over 1900 mm (75.4 in) at higher elevations (B.C. Ministry of Environment, 1982).

3.8 AREAS OF INVESTIGATION WITHIN THE INVENTORY

Eight primary areas of investigation are required in the descriptive inventory: general description, boundaries and edges, landform, vegetation, water and river drainage systems, focal attractions and land use. Criteria for carrying out these aspects follows:

3.8.1 GENERAL DESCRIPTION

A general description of the area under study - whether a VRMA landscape unit, viewshed or SAU - should identify dominant pattern elements (form, line, colour, texture) and their scale relation-

[1] There is considerable intrinsic value to portals, or edges between landscape units (Tetlow and Sheppard, 1977). A change of character creates interest in these zones. Where units are small, with common edges, aesthetic values are high; where large, the viewer is less aware at the center, even though the unit holds high overall scenic value.

ships. It should also define, in narrative terms, the area's regional characteristics in terms of climate, imageability, regional symbolism and relationship with adjacent physiographic units. The general description of the Slocan Valley Landscape Unit within Section 3.7 serves as an example of a fairly comprehensive general description. The primary value of the general description is in its "thematic" aspects which lead to more specific descriptions of boundaries and edges, landforms, vegetation, etc. as noted above.

PLATE 3.11 A general description of the Fraser Plateau Biotic Region would emphasize its rolling, park-like quality. (B.C. Ministry of Environment photo)

It is essential that the visual analyst incorporate such regional imagery and symbolism in the inventory evaluation. Any visual impacts strongly out of context with the established natural/cultural regional pattern could seriously discolour and weaken that image; one that the observer may even cherish as "their own".

3.8.2 BOUNDARIES AND EDGES

Boundaries and edges are extremely important delineators of change or alteration between one type of landscape and another. Edges can be defined as "the linear boundaries between various types of landscape elements" and occur where physical character of the land form changes: (U. of Michigan, 1967). Edge enclosure can be topo-

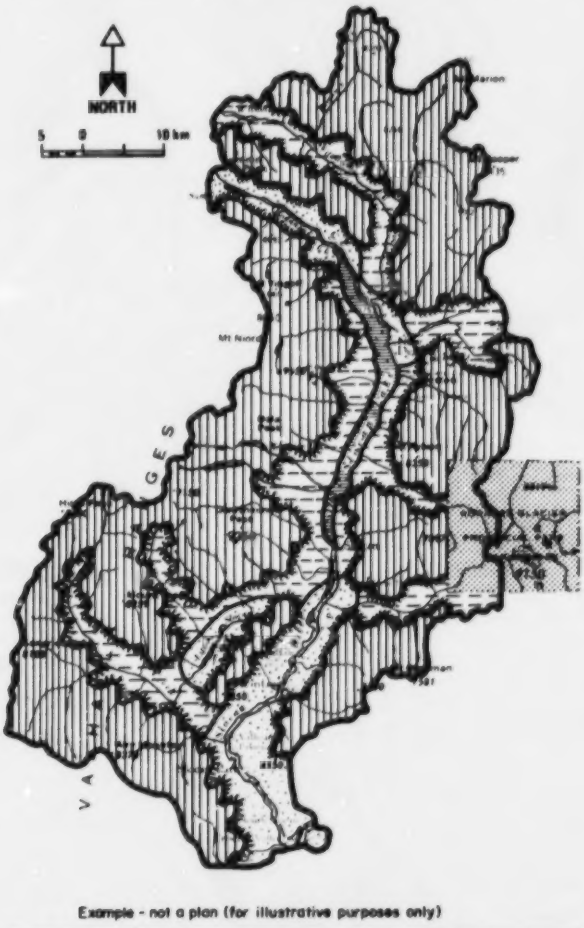


FIGURE 3.9 Slocan Valley Landscape Unit: Boundaries and Edges

graphic or vegetative. It can be regular, irregular, and partially or totally enclosed. Enclosures may be single-sided such as an abrupt rise flanking a flat plain, or irregular, exemplified by a U-shaped valley with its side valleys. A cirque lake is a good example of enclosure and sharp boundary definition. Skyline character should not be overlooked as a boundary definition Figure 3.9 illustrates generalized boundaries and edges in the Slocan Valley Unit.

PLATE 3.12 Scenic water/land edges can be particularly vulnerable to visual deterioration

PLATE 3.13 Landform and topography within the Slocan Valley landscape unit

3.8.3 LANDFORM AND TOPOGRAPHY

Landform characteristics such as scale and silhouette are a primary means of differentiating one VRMA or landscape unit from another.

The visual dominance of a landform or series of landforms should be identified. Contrasts between boundaries and transition zones can also be distinguished by landforms. Figure 3.9 shows dominant landforms characteristic within the Slocan valley.

3.8.4 VEGETATION

A study of vegetative cover is essential to the landscape inventory and may be of even greater importance to the visual assessment process than physical features. The latter are predetermined by geological processes and less likely to be manipulated than vegetation which can be enhanced by design.

Vegetation is significant in the degree to which seasonal colour, texture density and patterns and tree or shrub connective margins contribute to landscape diversity. Landscape units may often be delineated by vegetation edge and mass characteristics which also indicate the presence of water in more arid environments.

Vegetation cover has been broken down into six main descriptive categories:

1 - Tree cover
2 - Meadow
3 - Scrub cover
4 - Marshes or poorly drained peatland-moss areas
5 - Grasslands
6 - Non-vegetated alpine or alpine areas

Connective margins, or edges between major vegetation changes, can be 1) sharp, e.g. coniferous species; 2) transitional, e.g. mixed

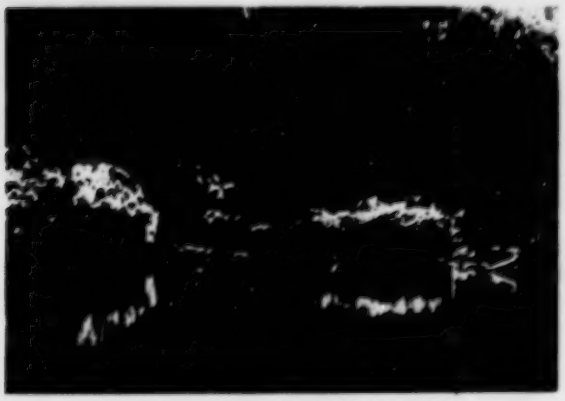


PLATE 3.14 Evergreen and deciduous textural patterns blend together in this high mountain lake reflection

deciduous/coniferous; 3) digitate e.g. interlocking fingers, such as found in an oak forest and 4) diffuse; soft and gradual e.g. broadleaf maple trees in coastal British Columbia forests (adapted from Litton, Tetlow et al., 1974). Figure 3.10 depicts generalized vegetative cover in the Slocan Valley.

3.8.5 WATER AND RIVER DRAINAGE SYSTEMS

a. Inland Water Systems

British Columbia contains approximately 3 million hectares of major lake bed and 12 000 river bank kilometres in its five major river systems. Stream bank miles in other connecting river and stream systems are equally extensive (Secter, 1979). Thus water assumes particular significance in British Columbia as a visual component of the landscape. Movement is an especially significant aspect of water in visual terms. In the descriptive inventory rivers are described as braided, meandering, sinuous and straight. Movement is categorized in terms of chutes, cascades, boils, rollers, and riffles (Chamberlin, T., 1980).

Various shoreline configurations define different water systems of high visual interest.

FIGURE 3.10 Slocan Valley Landscape Unit: Vegetative Patterns

PLATE 3.15 A storm over Kootenay Lake dramatically highlights the scale of this inland water body

Edge characteristics are of particular interest to the visual analyst. They call for a fairly detailed accounting of shoreline contrast, spatial extent, riparian qualities and evidence of human modification (Litton et al., 1974). Fluctuating reservoirs should be inventoried to portray seasonal variations (i.e. drawdown) which may have pronounced visual impacts. Figure 3.11 shows major lakes and streams in the Slocan Valley mapping example.

b. Coastal Marine Environments

Descriptive inventory of the B.C. coastal marine environment (Biotic Regions 1-5 and Region 8, Figure 3.2) calls for measurement of a somewhat different set of factors than with inland water and river drainage systems. Here, the visual environment expresses itself most strongly in a linear system of geological segments, within which discrete landscape units can be identified (EDAW, et al., 1981) in basic relation to foreshore, backshore and headland characteristics.

British Columbia contains approximately 27 000 km of marine coastal shoreline with a commensurately extensive acreage in estuaries, intertidal and sub-tidal lands (Secter, 1979).

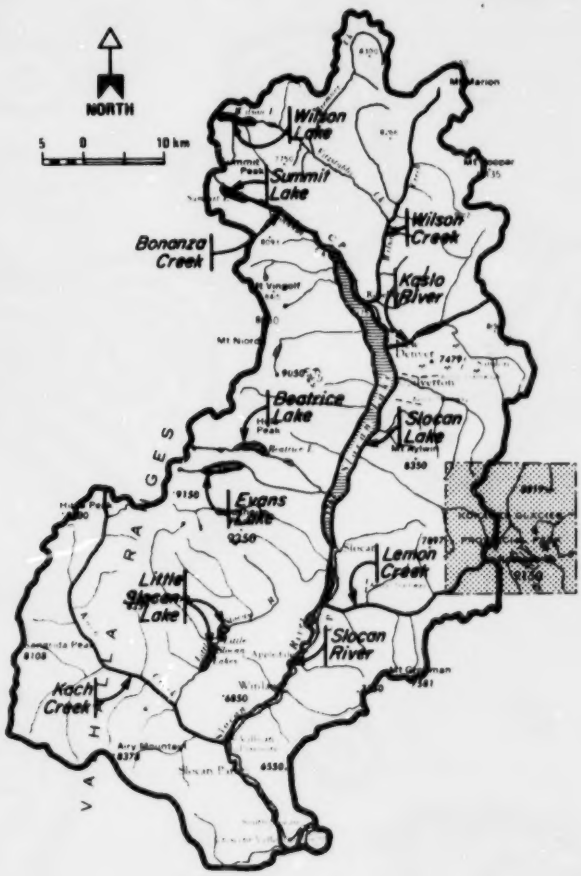
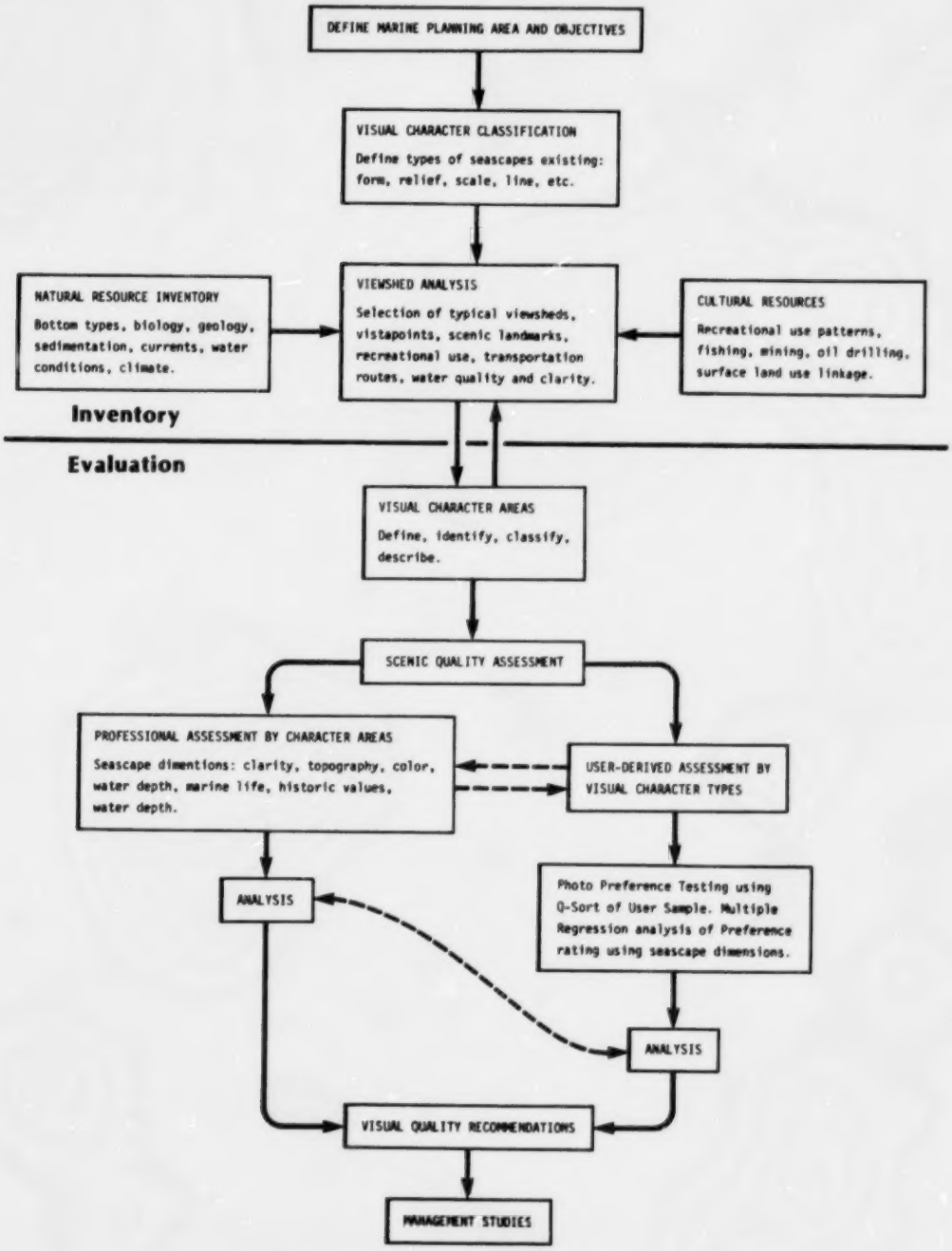


FIGURE 3.11 Slocan Valley Landscape Unit: Major Lakes and Streams

TABLE 3.1

Seascape Visual Assessment (Adapted from Mills, 1979)


DEFINE MARINE PLANNING AREA AND OBJECTIVES
VISUAL CHARACTER CLASSIFICATION
Define types of seascapes existing: form, relief, scale, line, etc.
NATURAL RESOURCE INVENTORY
Bottom types, biology, geology, sedimentation, currents, water conditions, climate.
VIEWSHED ANALYSIS
Selection of typical viewsheds, vistapoints, scenic landmarks, recreational use, transportation routes, water quality and clarity.
CULTURAL RESOURCES
Recreational use patterns, fishing, mining, oil drilling, surface land use linkage.
Inventory
Evaluation
VISUAL CHARACTER AREAS
Define, identify, classify, describe.
SCENIC QUALITY ASSESSMENT
PROFESSIONAL ASSESSMENT BY CHARACTER AREAS
Seascape dimentions: clarity, topography, color, water depth, marine life, historic values, water depth.
USER-DERIVED ASSESSMENT BY VISUAL CHARACTER TYPES
ANALYSIS
Photo Preference Testing using Q-Sort of User Sample. Multiple Regression analysis of Preference rating using seascape dimensions.
ANALYSIS
VISUAL QUALITY RECOMMENDATIONS
MANAGEMENT STUDIES

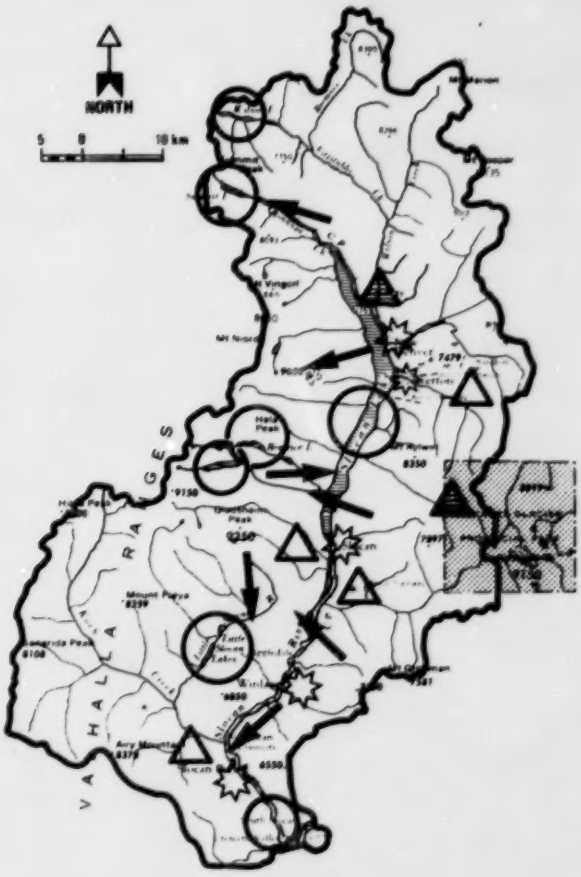
Edge features are dramatic in this environment, where bluffs, boulders, rock outcrops, fjords, tombolos, pocket beaches, caves, spits and bars become a foil for the seascape beyond. These areas and zones are extremely sensitive to urbanization, industrialization, transportation and recreation uses.

PLATE 3.16 Most of the B.C. coastal zone is dramatic, visually complex and sensitive to development

Table 3.1 illustrates a hypothetical model for inventorying and evaluating coastal marine environments that could be applied in British Columbia. Appendix D.3 deals more explicitly with aesthetic factors involved in conducting visual quality assessments in the marine coastal environment. See also, Bauer, 1974 and Howes and Owens, 1982.

3.8.6 FOCAL ATTRACTIONS, LOCAL FEATURES AND KEY OBSERVATION POINTS (KOP)

The visual inventory should identify and graphically document focal attractions, both natural and man-made. These would include interesting and/or unusual land or rock formations, plant associations, volcanic plugs, waterfalls, thermal springs and similar phenomena of specific visual interest (Block and Hignett, 1982). Features, due to their interest values, become focal points of recreational, scientific and



Legend

Features (lakes, major streams)

Key Observation Points (KOP)

Man-made (Cultural) Developments

Parks

Activity Nodes

FIGURE 3.12 Slocan Valley Lanscape Unit: Focal Attractions and Key Observation Points (KOP)

ecological value.

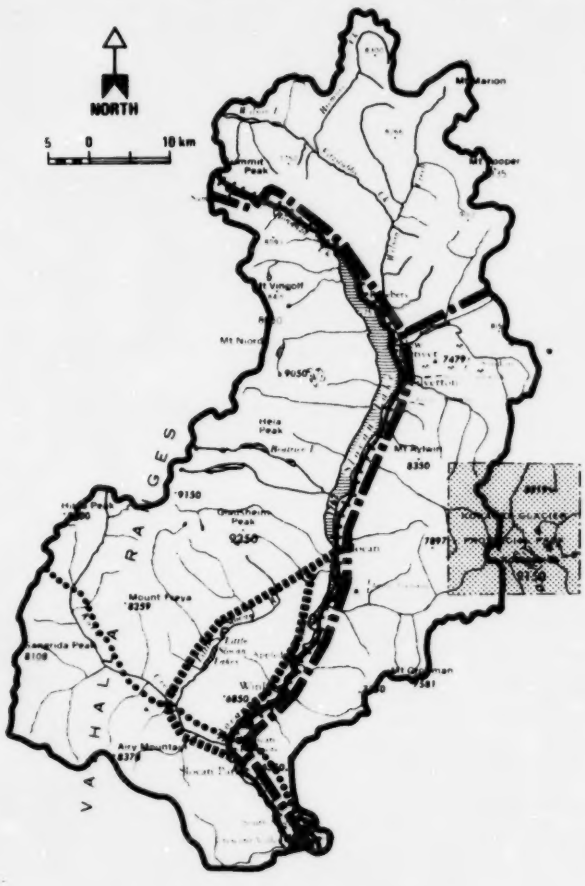
Local features of visual interest are generally known to residents of the area under study but may not have a high profile from a regional perspective. These may include walking trails, "swimming" holes, landmark rock outcrops and local historical markers. An inventory of local features can usually be obtained through a survey questionnaire or by canvassing special interest groups (natural history societies, hiking clubs, historical societies, etc).

PLATE 3.17 "Painted Canyon" along the Murray River is an unusual rock formation of high focal interest

Key observation points (KOP) are identified on the basis of their command of vistas, axial terminations and critical points of interest. They usually exist on major access routes or trails (see Figure 3.12).

3.8.7 LAND USE AND MAN-MADE ELEMENTS

Land use impacts on the visual environment include urbanization, impoundments, agricultural use, road and rail lines, banks and nature trails, mining, dredging, logging, harbours, industrial operations, and other management activities. When possible, visual evidence of air, water or land



Example - not a plan (for illustrative purposes only)

Legend

Major Highway

Secoundary Highway

Railway

Major Powerline Corridor

FIGURE 3.13 Slocan Valley Landscape Unit: Transportations and Utility Services

PLATE 3.18 Urbanization within a highly natural setting as in this case, can be a visually dominant element

PLATE 3.19 This trail on Valdez Island holds local interest and should be a part of the descriptive inventory

pollution should be documented. The landscape inventory should also identify and graphically indicate historical and archeological site

PLATE 3.20 Agricultural land use patterns often enhance their surroundings visually

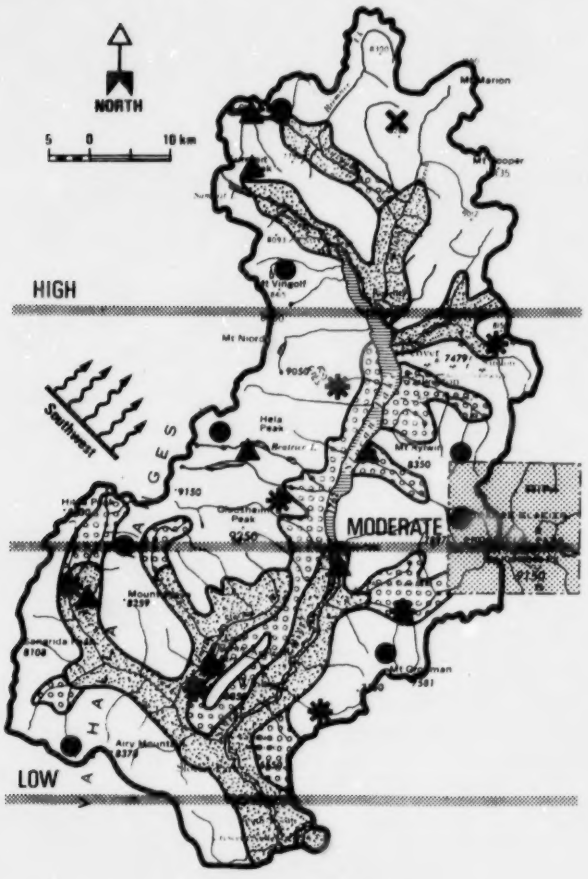
locations of regional, provincial and national significance.

3.8.8 BIOPHYSICAL CHARACTERISTICS

Where required, the descriptive inventory may

PLATE 3.21 Exposed and unstable slopes above this gravel pit near Shuswap Lake dominate an enclosed highway view

call for documentation of specific biophysical data which are visually significant such as:



Example - not a plan (for illustrative purposes only)

Legend

Soil Stability Good

Soil Stability Moderate

Soil Stability Poor

Wildlife Capability:

- Elk
- Deer
- Bear
- Sport Fish

High Precipitation — HIGH

Moderate Precipitation — MODERATE

Low Precipitation — LOW

Prevailing Winds

(continued)

FIGURE 3.14 Slocan Valley Landsape Unit: Biophysical Characteristics

1. Soils stability and productivity levels (for determining vegetation regeneration)
2. Soil and rock colour contrast values (when exposed).
3. Terrain characteristics (beyond general landform description)
4. Aquatics and hydrology (for mapping stream and lake visual characteristics)
5. Presence of wildlife (for possible value as a viewing experience)
6. Climate (moisture and temperature regimes which often cause "breaks" between visual units as noted in Section 3.4)

An analysis of biophysical resources will reveal other land capability designations and the land's relative biophysical capacity to accomodate any management activity with varying effects on the visual environment (see Chapter IV, Section 4.6, "Visual Absorption Capability [VAC]").

Maps covering the above biophysical components are available for a considerable portion of the province from the B.C. Ministry of Environment (Assessment and Planning Division Catalogue, 1981). Figure 3.14 indicates generalized biophysical characteristics in the sample study area.

3.9 AN INVENTORY PROCEDURAL CHECKLIST

Define the Regional Setting

Identify the landscape setting and mapping scale to be used. The descriptive inventory is best understood within the framework of its regional and sub-regional setting. An appropriate scale of mapping should be determined at this

point. Identify physiographic and biotic regions. Satellite imagery and photo stereo pairs are extremely valuable at this stage of data assembly.

Define Visual Resource Management Areas

Define and describe Biotic Sub-regions (Visual Resource Management Areas (VRMA)) and landscape units in terms of general description, boundaries and edges, landform and topography, vegetation, water (inland or marine coastal), focal attractions and local features, land use and man-made elements and biophysical characteristics. At this point, scenic assessment unit boundaries can be defined at a preliminary level and key observation points (KOP) noted on maps and pre-typed air photos[1]. These will become basic to the scenic quality assessment. KOPs are later confirmed and photographed after traveling through the area on major access routes where critical viewpoints commanding primary viewsheds become obvious. Photographs from these points should be included in the narrative accompanying the inventory map, or maps, and may require splicing to encompass the KOP field of vision.

Initiate Narrative Account

A narrative or expanded map legend accompanying base maps is essential to identify facets that do not lend themselves to graphic documentation. The narrative should accompany the factual inventory maps to cover intangible factors such as climate and land and water pollution (where known). Examination of any pertinent literature and local information on the project area can provide data which may well be incorporated in both the map and narrative accounts.

[1] "Pre-typing" refers to initial and direct mapping on air photos with colored pencil. These are later taken to the field for verification, following which the data can be transferred to scaled maps.

Field Work

Field work is essential to the landscape inventory. Previously "pretyped" air photo pairs need to be checked for ground truth. Presence on the site or area is required to accurately confirm boundaries of scenic assessment units (SAU), viewsheds, visual units and feature or focal attractions.

Products of the inventory at this point should include graphic representations such as diagrams, photographic examples, occasional tables, graphs and field sketches. The latter can abstract from the complexity of the landscape by capturing the "essence" of a place and simplifying the impression a photo usually gives (Litton, 1978).

Low level air reconnaissance is extremely valuable in field work, particularly in British Columbia, where distances between points of vehicular access can be great and time costs critical. Air coverage is an excellent means to identify:

1 - major landform components
2 - extensive riparian environments
3 - ecological relationships existing between landscape units
4 - major edges and margins between areas of contrast
5 - connecting area elements such as ridge lines, side valleys and portals

However, where possible, it is important to get on the ground for sketching and photography, or for ground-checking special features.

Although vehicular coverage tends to be discontinuous and fragmented, depending on existing access to the project area, it does allow on-the-ground documentation of vegetation, water forms, land cover and man-made and cultural components of the landscape. Where costs are a limiting factor, or the project is site-specific the inventory may well involve a brief but intensive overview by either air or ground reconnaissance.

Biophysical Map Review

Subsequent to initial field work, biophysical mapping should be reviewed and pertinent information extracted in overlay form. Such overlays can then be directly related to the landscape inventory base map. Additional field work may be required to verify this information as it may or may not relate to visual resources. For example, slope stability (based on terrain maps) and soil characteristics such as colour and texture (soils maps and reports) reveal visual vulnerability potential if a road or utility corridor is proposed where soils would be exposed and highly visible.

Biophysical data will also be required in determining visual absorption capability (VAC) as outlined in Chapter IV, Section 4.6.

Delineate Inventory For Presentation

The landscape inventory map(s) and narrative should now be in preliminary form and ready for delineation. Interpretation of map and narrative will be required by user groups involved in the assessment process. Their preferences, value systems and place in the visual environment as "clients" must now be considered as noted in Appendix B.

CHAPTER 4

"Quality evaluations of the visual resources of different landscape units must be based on (their) inherent capacity to evoke perceptional response rather than on the subjective preference of the investigator or even the public at large" (Scheele and Johnson, 1979).

Chapter Separator Photo

PLATE 4.1 Off-loading coal at Roberts Bank. (B.C. Ministry of Environment photo)

4 VISUAL ASSESSMENT PROCEDURES

4.1 BASIC ASSUMPTIONS

> "The ultimate goal of landscape analytical procedures and management strategies is to maintain the integrity of the landscape. It would be a most serious mistake to give the highest protection to the more scenic parts of the landscape while the whole surroundings, perhaps being distinguished less visually, were given short shrift relative to their particular characteristics. Jewels of the landscape lose quality if they are displayed against a tattered and degraded surrounding, and landscape quality ceases to be." (R. Burton Litton, in a personal communication to the author in 1976. Author's emphasis underlined).

There is an implied assumption in Litton's comments that in the natural landscape the most natural condition is preferable. The second assumption is that although areas of high scenic quality have highest priority for protection even moderate quality areas must be protected so that the characteristic visual quality of the region remains intact. The implication for contrast rating is that the development which most often repeats the form line, colour, texture, and scale of the characteristic landscape is the most preferred.

The User Guide is in support of these assumptions which become the basis for assessment procedures outlined in this Chapter and will be applied at the following levels:

1. Element-oriented assessments, which define visual quality as the presence of preferred visual elements and the absence of disliked elements (Jones and Jones, 1977). Such applications are made in the case of cooling towers, wheat storage basins, dam structures, imposing buildings or bridges, etc.
2. View-oriented assessments, which appraise visual relationships between the elements of individual scenes. Applications include mining extractions, industrial or hydro site development (installations), new town developments (views from) and logging operations.
3. Area-oriented evaluations, which assess the visual quality of distinct places in the landscape as the summation of a number of views. Examples include broad level

PLATE 4.2 This grain storage elevator is a highly visible element within the community of Wynndel

PLATE 4.3 Visual assessment of this Slocan River viewpoint would recognize riparian vegetation as a strong edge factor

regional and strategic planning, linear developments, e.g. transmission lines, pipelines, highways, etc. and scenic corridor assessments.

The above levels of application should be made following the assembly of mapped baseline inventory data since the latter reveal background information in terms of landform, vegetation, water and man-made elements that are essential to the visual assessment.

Procedure:

The Descriptive Inventory outlined in Chapter Three constitutes a land base framework for assessment of visual quality. Chapter Four identifies specific procedures for establishing scenic quality, visual sensitivity, distance zones, determination of VRM Classes and means for establishing visual impact predictions.

The following assessment methodologies have drawn extensively upon work in the U.S. of the Bureau of Land Management, Jones and Jones, Litton and, in British Columbia, that of Paterson, Reid and Yeomans.

4.2 SCENIC QUALITY

Scenic quality is the overall impression retained after driving through, walking through or flying over an area of land (U.S. Bureau of Land Management, 1980). A mapping unit for scenic quality, the scenic assessment unit (SAU) was described in Chapter Three, Section 3.7.

In the Scenic quality assessment each SAU is evaluated for seven key factors: 1) landform, 2) vegetation, 3) water, 4) colour, 5) influence of adjacent scenery, 6) scarcity, and 7) cultural modifications. Criteria governing these measurements, although somewhat subjective[1], are noted in Table 4.1. If the evaluator has properly carried out the descriptive inventory, scenic quality relationships should be readily seen.

As noted in Chapter Three, scenic quality levels may, in addition to lying within the SAU, be directly applied to a single landscape unit or VRMA where little differentiation in landform, vegetation and water may exist within an extensive geographic area having little topographic variation.

In any case, three levels of scenic quality are determined for areas other than Coastal Marine VRMAs (see below): Class A, or high quality, Class B, moderate and Class C, low to non-existent. Criteria governing these determinations must be applied on a regional basis rather than strictly within the mapping unit. This allows for consideration of "adjacent scenery" and "scarcity" (Table 4.1).

PLATE 4.4 Kalamalka Lake and surroundings could be rated "Class A" in scenic quality

Scenic quality levels are assigned to each of the seven key factors listed in Table 4.1 on the basis of an equal ranking of 1 to 5 except for cultural modifications, which would generally rate no higher than 1 if they added to the area's scenic

[1] All numerical assignments are subjective to some degree. The visual analyst must use these figures with restraint, since they are basically indicators, not absolutes.

TABLE 4.1

Criteria Governing Scenic Quality Rating Procedures
(After USDI Bureau of Land Management, 1980)

	Criteria For Determining Scenic Value Scale						
	High	Rating [1]	Moderate	Rating [1]	Low	Rating [1]	Comments
Landform	High vertical relief as expressed in prominent cliffs, spires or massive rock outcrops, or severe surface variation or highly eroded formations including major badlands or dune systems; or detail features dominant and exceptionally striking and intriguing such as glaciers.	3 to 5	Steep canyons, mesas, buttes; or interresting erosional patterns or variety in size and shape of landforms; or detail features present and interesting though not dominant or exceptional.	1 to 3	Low, rolling hills, foothills or flat valley bottoms. Interesting detail landscape features few or lacking.	-2 to 1	
Vegetation	A variety of vegetative types as expressed in interesting forms, textures, and patterns.	3 to 5	Some variety of vegetation, but only one or two major types.	1 to 3	Little or no variety or contrast in vegetation.	-2 to 1	
Water	Clear and clean appearing, still or cascading white water, any of which are a dominant factor in the landscape.	3 to 5	Flowing, or still, but not dominant in the landscape.	1 to 3	Absent, or present, but not noticeable.	-2 to 1	
Colour	Rich colour combinations, variety or vivid colour; or pleasing contrasts in the soil, rock, vegetation, water or snow fields.	3 to 5	Some intensity or variety in colours and contrast of the soil, rock and vegetation, but not a dominant scenic element.	1 to 3	Subtle colour variations, contrast or interest; generally mute tones.	-1 to 1	
Adjacent Scenery	Adjacent scenery greatly enhances visual quality.	3 to 5	Adjacent scenery moderately enhances overall visual quality.	1 to 3	Adjacent scenery has little or no influence on overall visual quality.	-2 to 1	
Scarcity	One of a kind; or usually memorable, or very rare within region. Consistent chance for exceptional wildlife or wildflower viewing, etc.	3 to 5	Distinctive, though somewhat similar to others within the region.	1 to 3	Interesting within its setting, but fairly common within the region.	-2 to 1	
Cultural Modifications	Free from aesthetically undesirable or discordant sights and influences; or modifications add favorably to visual variety.	3 to 5	Scenic quality is somewhat depreciated by inharmonious intrusions, but not so extensive that the scenic qualities are entirely negated or modifications add little or no visual variety to the area.	1 to 2	Modifications are so extensive that scenic qualities are for the most part nullified or substantially reduced.	-3 to 1	

[1] Composite Quality Rating Scores

A = 21 to 35 points

B = 8 to 20 points

C = -16 to 7 points

Rating scores ranging from -3 to 5 are suggestive only. The evaluator may assign scores within these basic numerical units where subtleties of scenic elements warrant, but should justify these ratings in his narrative report.

NOTE: Adjacent Land/Water: Where possible, rate lands adjacent to or within Crown land administrative units to obtain proper regional/scenic relationships.

Timing: Rate for scenic quality under the most critical conditions, i.e., under highest seasonal use; with sidelighting instead of front or back lighting conditions (see Chapter 2, Sec. 2.3.1).

Scenic Assessment Unit Boundaries:

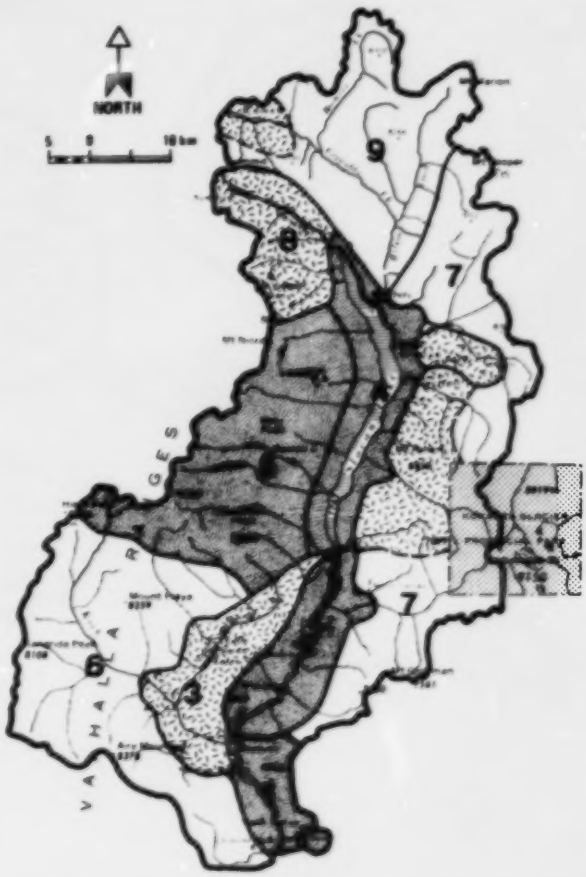
See Section 3.6, p. 24

value, e.g., bridges, dams, rail and road lines, tree plantations, well sited architecture and landscape architecture, and even a minus factor if incompatible or inappropriate.

The Coastal Marine Zone expresses a somewhat different set of aesthetic values than found elsewhere in the province. Scenic assessment of this environment is deserving of a methodology more reflective of subtle aesthetic variations, as well as potentially positive effects of cultural modifications such as lighthouses, settlements, harbours, etc. which can often add to an otherwise uniform or monotonous seascape. Since 15 VRMAs within eight Biotic Regions front the sea in British Columbia, these values are needful of future documentation and field testing as development projects come on line within this unique and sensitive visual environment. See Appendix D.4 for recommended Coastal Zone field form examples.

PLATE 4.5 This view of Kootenay Lake would qualify for a "Class B" scenic quality rating

Returning to the basic scenic quality level appraisal recommended for most of B.C., the Slocan Valley Landscape Unit will serve as an example of application where ratings are summarized as follows:



Example - not a plan (for illustrative purposes only)

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Scenic Quality Rating:

(A) High

(B) Moderate

(C) Low

Scenic Assessment Unit 9

FIGURE 4.1 Slocan Valley Landsape Unit: Scenic Quality

Landform rated "high" (5) in scenic quality by virtue of extreme variations in topography, visual diversity, interesting valley contrasts and topographical cohesiveness of the entire area.

Vegetation is typical of the VRMA and, except for riparian relief along the Slocan River and its tributaries, is primarily hemlock, spruce and cedar, with some deciduous elements along watercourses. It was given a "moderate" rating (3).

Water rated "high" in scenic quality (5) by virtue of Slocan Lake's clear water, pristine qualities, dramatic edge features and the sinuous, placid to tumbling aspects of the Slocan River.

Colour is prominent along the valley floor, particularly during the fall months, but surrounding ridges and mountains are largely monochromatic (deep green) and blue. Colour was given a rating of 3, or "moderate".

Adjacent scenery was rated 3, or "moderate" since, although high in relief and offering considerable variety, adjacent scenery is not unusual or outstanding in a regional context.

PLATE 4.6 Uniform tree stands and low topographic relief reduce scenic quality in this area to "Class C" (0-11)

Scarcity was given a high rating (5) due to the unusual and dramatic relationships existing between Slocan Lake and the Valhalla ranges which rise abruptly from the lake's eastern shoreline and are accessible only by water. This factor is unique to the VRMA and to the region as well.

Cultural modifications are moderate to severe in the vicinity of Slocan village, where a large sawmill intrudes upon the natural landscape and reduces adjacent air quality to some extent. However, there are no other serious cultural modifications of a negative nature in the valley which is, in fact, enhanced by pastoral modification (agriculture). Cultural modification was therefore given a rating of 1. With the highest possible chart score being 35, the Slocan landscape unit rated 23, or "high" (level A).

4.3 ESTABLISHING VISUAL SENSITIVITY LEVELS

Visual sensitivity is defined as "the degree to which any portion of the landscape is sensitive to, or liable to be visually degraded by, man-made developments - either proposed or existing" (Bureau of Land Management, 1980). The interaction of two factors is involved in measuring an area's visual sensitivity levels: (1) user volume and (2) user attitudes relative to existing or proposed modifications of the natural landscape.

User volume is a measure of travel frequency within the landscape and relates directly to accessibility, leisure time availability and local use. Where possible, travel volume should be measured within provincial distance standards or travel time gained from highway origin and destination (O and D) studies, park user statistics, tourism travel estimates, and projections, economic forecasts and local questionnaires and field observations over scheduled time periods. The SAU is then assigned a high, medium or low user volume rating according to regional and/or provincial travel standards.

PLATE 4.7 Visual sensitivity levels are high in this Kootenay River scene

User attitudes, although more difficult to assess, can be obtained by survey questionnaire, public workshops and hearings where reactions to proposed modifications to the landscape are solicited (see Appendix B). Public reaction is evaluated and mapped as high, mediun or low. User attitude is of greater importance and weighted higher than user volume in this evaluation. After overlaying user attitude with user volume on each SAU a visual sensitivity matrix is used to determine visual sensitivity levels (Table 4.2). See Appendix B, "User Preference Factors" for further classification of guidelines to measurement of user attitudes.

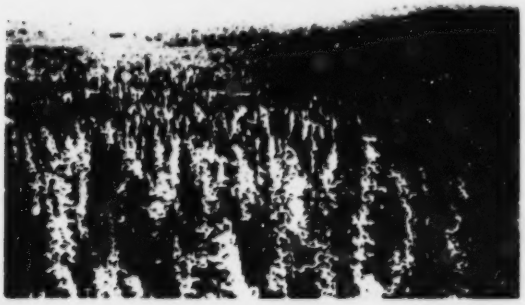
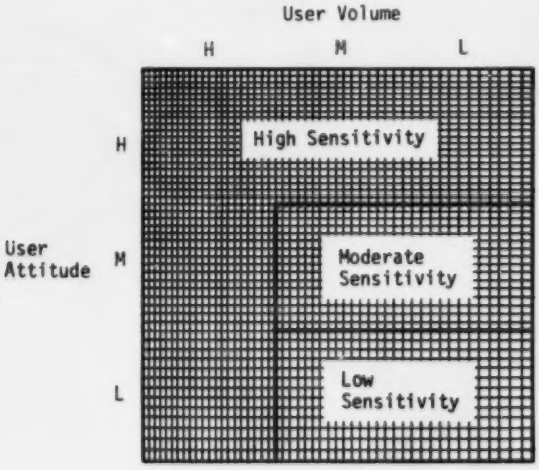


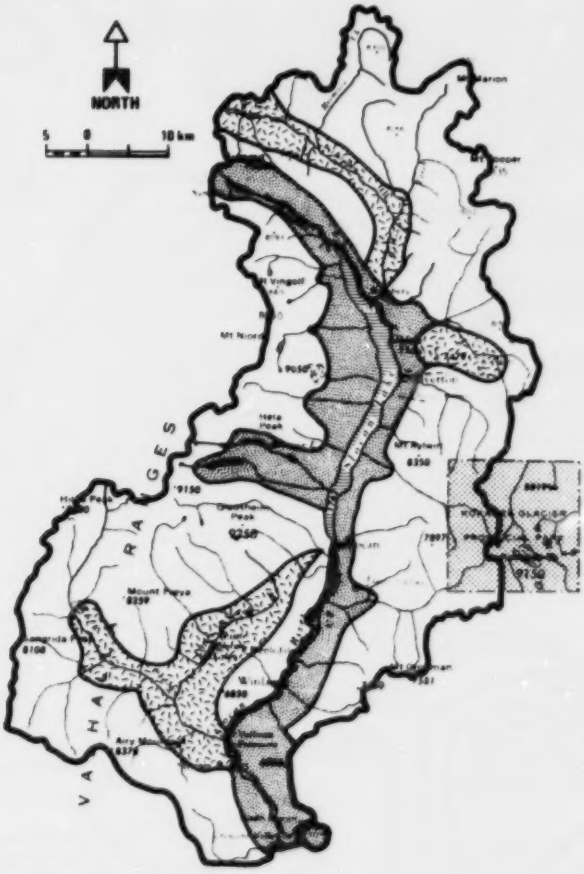
PLATE 4.9 Development activities could occur in this area with little effect on its level of visual sensitivity

PLATE 4.8 Creston Flats: an area holding moderate sensitivity to development

TABLE 4.2

Visual Sensitivity Level Matrix





Example - not a plan (for illustrative purposes only)

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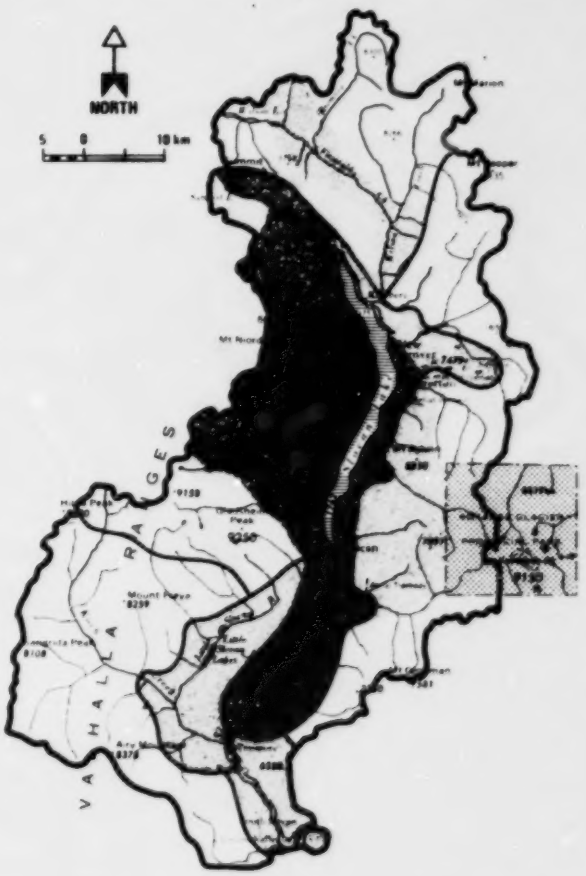
High	
Moderate	
Low	

Procedure:

Using scenic assessment boundaries, delineate user volume (high, medium, low) from all available Provincial transportation data.

Map should be accompanied by standards leading to reasonable accurate definitions of "high", "medium" and "low" user volume.

FIGURE 4.2 Slocan Valley Landscape Unit: User Volume



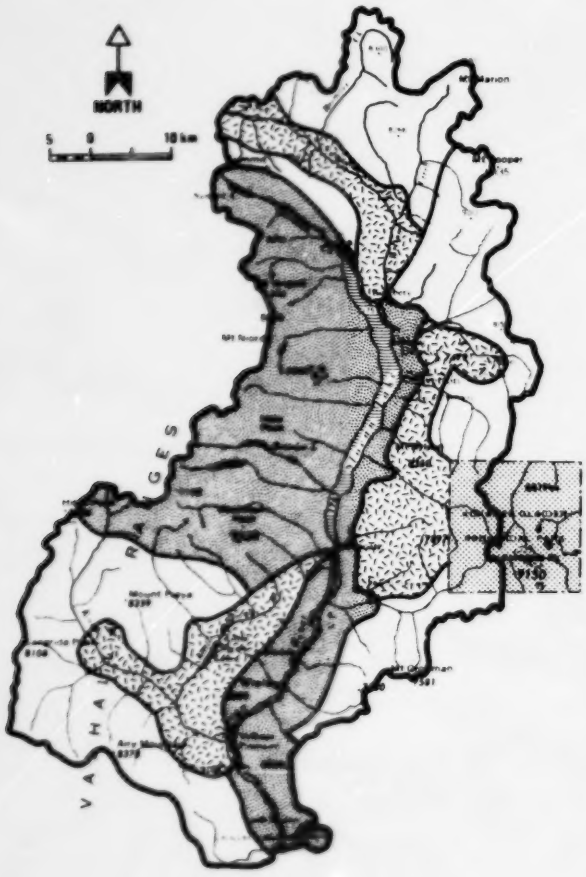
Example - not a plan (for illustrative purposes only)

Legend

High Concern	
Moderate Concern	
Low Concern	

Procedure: Using Scenic Assessment Unit boundaries, delineate all areas of high, moderate and low user attitudes relative to actual or proposed modifications to the natural environment.

FIGURE 4.3 Slocan Valley Landscape Unit: User Attitudes



Example - not a plan (for illustrative purposes only)

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High Sensitivity

Moderate Sensitivity

Low Sensitivity

NOTE: Sensitivity Levels are obtained by overlaying User Attitudes with User Volume (travel)

PROCEDURE: 1. Using Sensitivity Level Matrix delineate all areas of High, Moderate or Low sensitivity.
2. Evaluate all designated parks, ecological reserves and designated conservancies as "high" automatically.

FIGURE 4.4 Slocan Valley Landscape Unit: Sensitivity Levels

4.4 KEY OBSERVATION POINTS (KOP) AND DISTANCE ZONES

Scenic quality and visual sensitivity levels relate directly to how the landcape is seen and from what angle. Thus, visibility from main viewing routes and key observation points (KOP) mapped during the descriptive inventory phase, must be quantified in the overall visual quality assessment.

PLATE 4.10 A Slocan Lake KOP: any induced development would detract seriously from its scenic value and high sensitivity

Establishing distance zones based upon travel routes and pre-determined KOPs is essential to the determination of visual sensitivity classes. KOPs may be determined either by direct observations (Chapter III) or by computer graphics (Chapter IV, Section 4.7).

As noted in Chapter II distance zones fall into four categories: foreground, middleground, background and seldom seen areas (Litton 1972, BLM 1980, USFS 1974). See Glossary of Terms. These are mapped from key observation points (KOP).

Any determination of distance zones is complicated by the fact that what may be foreground in one instance could well be middleground from

another vantage point on an access route through the area. In this case the more restrictive foreground classification will be used since the closer the subject is to the viewer the more direct and detailed is his observation. However, middleground and background vistas, although far from the observer, can hold high scenic value as panoramic landscapes. Judgement will be required in evaluating these factors.

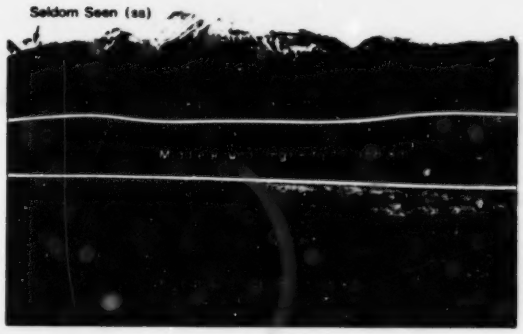


PLATE 4.11 Distance zones are clearly defined in this mountain-valley panorama but may not always be so in flatter terrain

Establishing distance zones based upon travel routes and pre-determined KOPs is essential to the determination of visual resource management classes.

4.5 VISUAL RESOURCE MANAGEMENT CLASSES (VRMC)

In order to provide a consistent provincial data base for conducting visual assessment a system of defining visual quality standards is required. This involves the delineation of Visual Resource Management Classes (VRMC). Five in number, they are derived by combining overlays of scenic quality, visual sensitivity and distance zones within the landscape unit (or VRMA). VR Management Classes become the basic tool for guiding mana e-ment of the landscape unit and VRMA collectively since they immediately indicate the landscapes[1]

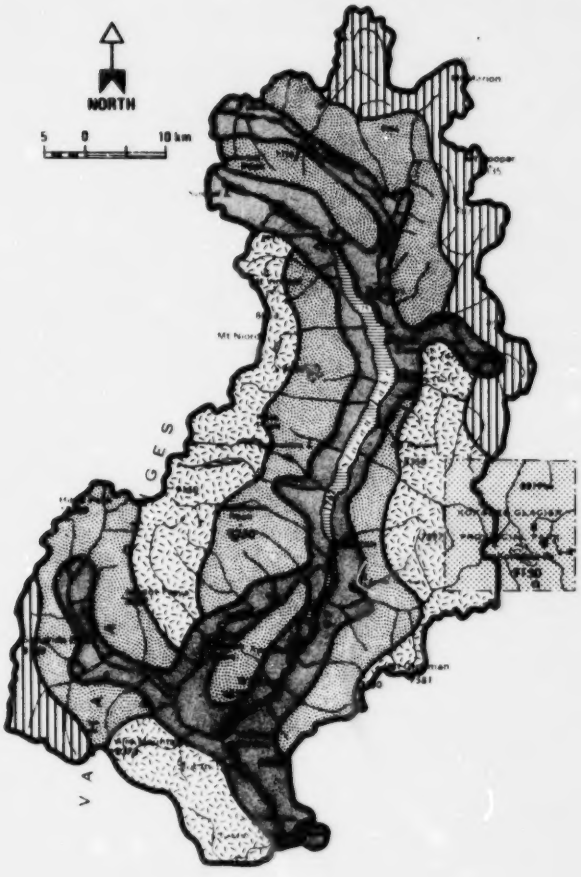
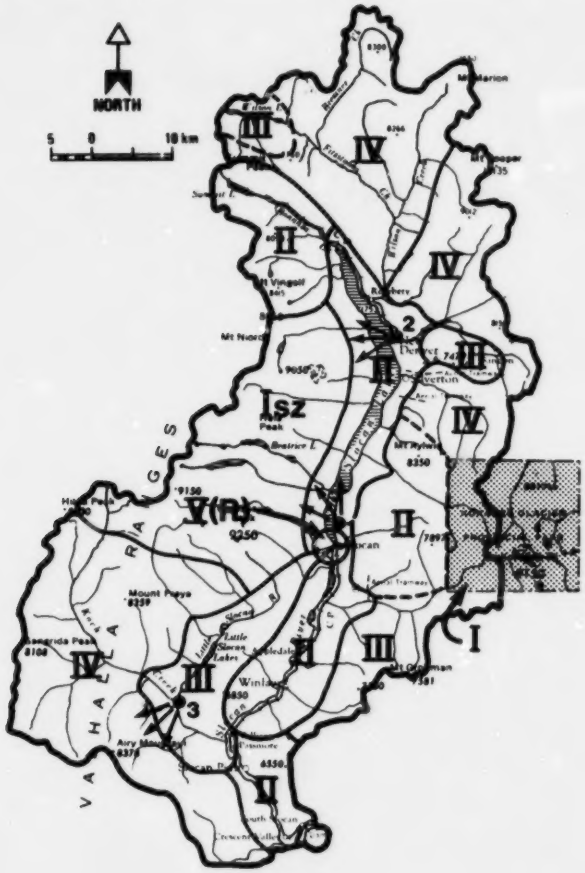


FIGURE 4.5 Slocan Valley Landscape Unit: Distance Zones



Example - not a plan (for illustrative purposes only)

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I Designated wilderness areas, parks, ecological zones; very sensitive; no development evident in FG, MG and BG

Isz Special zones or areas holding high scenic and recreation values but not formally designated as such; no development evident in FG, MG and BG

II Modification should not be evident in FG and MG but may be so in BG and SS

III Modification should not be evident in FG but may be so in MG and BG

IV Modification in FG, MG, BG and SS, but in accordance with character

V Modified; in need of enhancement or rehabilatation

V(E) Enhancement recommended

V(R) Rehabilitation recommended

●2 Assumed Key Observation Points

PROCEDURE: Combine overlays of scenic quality, sensitivity levels and distance zones. Refer to Management Class Rating Structure Table for criteria. Designate management classes. Note special areas or sites with cultural modifications in need of enhancement or rehabilitation.

FIGURE 4.6 Slocan Valley Landscape Unit: Management Classes

sensitivity to modification and/or development (Table 4.3).

Each VRMC is intended as a guide to management and development of the area under assessment in consort with the quantification of other recognized resource values, e.g., soils, water, wildlife, timber, etc.

The VRMC is not a mapping unit, but rather the placement of a value judgement in symbolic form within the study area boundary and at whatever scale that particular unit requires for clarification. It should be emphasized that such value judgements depend for their objectivity upon the level, accuracy and intensity of inventory and assessment preceding its assignment.

Each VRMC describes a different set of criteria governing man-made modifications in the degree to which they would visually affect the characteristic, or natural, landscape. Thus any proposed development would be referred to the Management Class assigned to a specific area to determine 1) its acceptance in the landscape, or 2) the degree of modification required for its accomodation at a level of minimal contrast with the area's form, line, colour, texture and scale.

TABLE 4.3

Matrix For Determining VR Management Classes
(Modified from USDI Bureau of Land Management, 1980)

Visual Sensitivity		High			Moderate			Low
Special Class Zones (SZ)		I(SZ)	I(SZ)	I(SZ)	I	I	I	I
Scenic Quality	A	II	II	II	II	II	II	II
	B	II	III	III	III	IV	IV	IV
	C	III	IV	IV	IV	IV	IV	IV
Distance Zones		FG MG	BG	SS	FG MG	BG	SS	all

DISTANCE ZONES..... FG - foreground
MG - middleground
BG - background
SS - seldom seen

VISUAL RESOURCE
MANAGEMENT CLASSES..... I, I(SZ), II, III, IV

Notes:

1. - If the area being evaluated is adjacent to any Management Class III or higher, select Class III; if lower, select Class IV

2. - Class I(SZ) applies only to classified or designated areas, e.g., parks, ecological reserves, natural areas, etc., as established through Provincial legislation or policy

3. - Management Class V does not appear in the matrix. This Class applies only to areas identified in the scenic quality inventory where the quality class has been reduced because of unacceptable cultural modifications or areas that have the potential for enhancement or rehabilitation. Indicate the latter as V(E) or V(R) where appropriate.

4. - Each Management Class describes a different degree of modification allowed in the basic elements of the landscape. The primary character of the landscape should be retained regardless of the degree of modification allowed.

(modified from BLM VRM Manual, 1980)

Visual management requirements inherent within the five classes follow:

Class I

This class is applied to designated ecological reserves, parks, wilderness areas, nature conservancy areas, and other similar designations where management activities are to be restricted in view of the area's high visual vulnerability and limited capability to sustain development. Any visual deterioration of the landscape would be unacceptable in this class. Any modification of the natural environment must not be evident in foreground, middleground or background distances. Any visual deterioration of the landscape would be unacceptable in this class.

PLATE 4.12 Tacheeda Lakes, in Northeastern British Columbia, would qualify as a Class I VR Management Area

Class I (SZ) - Special Zone

This class refers to areas/lands holding high scenic values of concern because of their relative scarcity in a regional, provincial or national context. As with Class I, any modification of the natural environment must not be evident in foreground, middleground or background distances. It is applied to designated greenbelts or scenic corridors, unusual viewpoint areas or zones, inland water and coastal marine shorelines of outstanding scenic content and similar special areas within the Province. It does <u>not</u> apply to moderate and low sensitivity areas (see Matrix, Table 4.3).

PLATE 4.13 The Rocky Mountain escarpment forms a dramatic backdrop for this example of a highly scenic Class I SZ corridor

PLATE 4.14 Development is minimal but blends well with the natural environment in this Kootenay Lake example of a Class II VR Management Area

Class II

In this class, contrasts with any of the basic pattern elements of form, line, colour, texture, and scale caused by management activity should indirectly reflect the area's dominant landscape pattern. Introduction of permanent elements or installations such as roads and utility lines are to be avoided, particularly within foreground (fg) distances. Adjacent areas of visual influence are rated in consideration of the primary zone rating. Contrasts created by management activities should not be evident in foreground and middleground distances but may be so in background and seldom seen distances.

Class III

In this class, an introduced activity or development may be evident in the foreground, middleground, background and seldom seen areas, but should remain subordinate to the characteristic landscape and repeat dominance factors of its pattern elements. Contrasts created by management activities should not be evident in foreground but may be evident in middleground and background distances.

PLATE 4.15 An example of a Class III VR Management Area, where introduced activities would remain subordinate to the natural landscape

Class IV

In this class, an introduced activity or development may be evident in foreground, middleground, background and seldom seen areas, but should repeat dominance factors of pattern elements found within the characteristic landscape. Contrasts created by management activities may be evident within this class but should remain capable of mitigation or enhancement to conform, where possible, with the characteristic landscape.

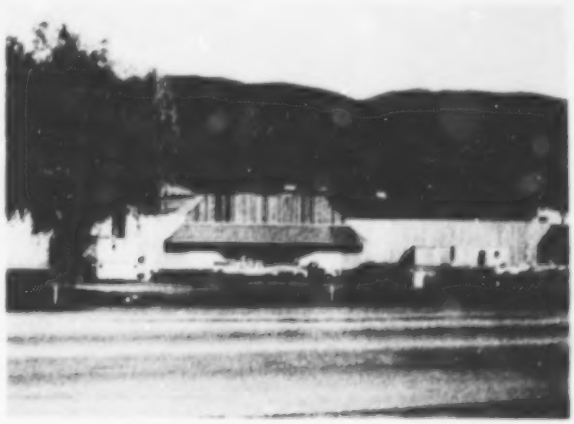

PLATE 4.16 A Class IV VR Management Area. The structure's horizontal alignment repeats pattern elements in the natural landscape

Class V; Class V (E) and Class V (R)

This Class refers to areas where maximum or severe modification has taken place to the detriment of the original natural landscape and may (1) either be accommodated with little or no effort toward rehabilitation, or (2) altered through design application to conform to a higher sensitivity class standard.

Lands in this class may have potential to increase their visual absorption capability through revegetation, screening, soil reclamation, etc. leading to a subsequent higher Management Class. It should therefore be considered an interim class

and indication given of short and long term objectives in terms of to Class V (E) - enhancement - or Class V (R) rehabilitation. Chapter V - "Management Options" - deals with these factors in more detail.

PLATE 4.17 This Class V VR Management Area would require rehabilitation before qualifying for a higher Class rating. (B.C. Ministry of Environment photo)

Example - not a plan (for illustrative purposes only)

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③ Example KOP's from Table 4.4

Approximate cone of vision

Refer to Table 4.4, "Determining Visual Resource Management Classes from Assumed Key Observation Points".

FIGURE 4.7 Assumed Key Observation Points

TABLE 4.4

DETERMINING VR MANAGEMENT CLASSES FROM ASSUMED KEY OBSERVATION POINTS (KOP)[1]

SCENIC QUALITY (From Table 4.1)	KOP #1	KOP #2	KOP #3
Landform	5	4	2
Vegetation	3	1	0
Water	5	5	1
Colour	3	1	0
Adjacent Scenery	5	3	2
Scarcity	5	4	1
Cultural Modifications	0	0	0
TOTALS	26	18	7
Scenic Value (From Table 4.1)	A	B	C
VISUAL SENSITIVITY LEVEL (From Table 4.2)			
User Attitude	H	H	L
User Volume	M	M	M
Sensitivity Rating	H	H	L
VISUAL RESOURCE MANAGEMENT CLASSES (From Table 4.3)			
Distance Zones			
Foreground	II	II	IV
Middleground	I(SZ)	I(SZ)	IV
Background	I(SZ)	I(SZ)	IV

[1] See Figure 4.7 for above KOP locations within SAU boundaries, Slocan Valley landscape unit.

TABLE 4.5

Visual Resource Management Class Requirements
(After Sheppard et.al., 1979)

Class I and I(SZ) - Any contrast created within the characteristic landscape must not be noticeable. The visual impact of a proposed modification may not exceed: Negligible, with a total score of 0 - 11[1] and the degree of contrast in any one element may not exceed Low, or subordinate, with an element score of 4
Class II - Changes in any of the basic visual elements should not be evident in the characteristic landscape; contrasts may be evidently seen but should not attract attention. The visual impact of a proposed modification should not exceed: Weak, with a total score of 12-23[1] and the degree of contrast in any one element should not exceed Low, or subordinatae, with an element score of 4
Class III - Contrasts may be evident; however, changes should remain subordinate to the existing characteristic landscape. Visual impact of a proposed modification may not exceed: Moderate, with a total score of 24-35[1] and the degree of contrast or dominance in any one element should not exceed Medium, or co-dominant, with an element score of 8
Class IV - Contrasts may attract attention and be a dominant feature of the landscape in terms of scale. However, the changes should repeat the other basic visual elements inherent in the characteristic landscape. Visual impact of a proposed modificataion should not exceed: Strong, with a total score of 36-47[1] and the degree of contrast or dominance in any element may be High, or dominant, but should not exceed an element score of 12 for elements other than scale.
Class V - Existing contrasts are inharmonious with the characteristic landscape, or the landscape has potential for enhancement or rehabilitation to acceptable visual variety. The visual impact of existing modification may be: Severe, with a score of 48 - 60 and the degree of contrast or dominance in any one element may be High, or dominant, with an element score of 12 or above.

[1] Contrast scores as proposed have not been adequately tested in the field and may require further modification through application to specific projects in British Columbia. See Table 4.8 for Contrast Rating Criteria.

4.6 VISUAL ABSORPTION CAPABILITY

While visual assessment procedures as outlined may give a realistic picture of sensitivities involved, they do not always realistically indicate biophysical capacity of the land to sustain a proposed development. Thus, even though a project may meet a management class standard visually, it may not do so in accordance with land capability. In this instance an assessment of visual absorption capabilty can prove of value.

Visual absorption capability (VAC) is defined as "the biophysical capacity of the landscape to screen proposed development and still maintain its inherent character" (Anderson, et al., 197?; Yeomans, 1979).

Biophysical factors include:

Slope angle and stability

The steeper the slope, the lower the VAC.

Soil and rock colour contrast

Vegetation pattern, diversity and colour contrasts

Vegetation screening ability

Site recoverability

Soil erodability (stability)

Landform diversity

Waterform diversity

PLATE 4.1R High soil stability and vegetation diversity around this Gulf Islands homesite give this site a high VAC rating

Visual absorption capability varies with the visual characteristics of the proposed landscape alternatives brought about by such activities as trail or road construction, clearcutting or strip mining. Generally, as the size of the activity increases, the project area's VAC decreases. As the duration increases, VAC decreases. Proposed activity and perceptual factors interact with biophysical parameters to determine probable visual impacts.

PLATE 4.19 In this scene, the valley has a moderate VAC value but VAC is low in the surrounding foothills

One of the main advantages of a VAC analysis lies in its direct and simple application of existing biophysical data (which is usually available from any base-line inventory in British Columbia) to the area under visual analysis. Another advantage is that since VAC is often inversely proportional to visual quality (the higher the VAC the more likely visual quality is low and vice versa) it can be used to indicate where more intensive visual assessment may be done on a regional scale. Figures 4.8a through 4.8d illustrate how VAC patterns can be overlaid to obtain a final reading of composite values, with the Slocan Valley serving as an example.

PLATE 4.20 Wapiti Lake and surroundings are low in VAC, primarily because of steep slopes and low vegetation regeneration potential

4.6.1 RECOMMENDED PROCEDURES FOR ASSIGNING VAC RATINGS

Step One: Define landscape units and/or viewsheds by air, ground and air photo examination

Step Two: Determine where VAC assessment is needed relative to project impacts

Step Three: Review basic assumptions, and Visual Quality objectives.

Step Four: Map slope, vegetation, soil and rock colour factors, and landscape diversity

Step Five: Assign biophysical sensitivity ratings (high to low) with the formula VAC = S x (E+R+D+C)

Where S = slope (the steeper the slope, the lower the VAC)

E = Soil stability and erosion potential (Positive factors raise VAC: negative factors lower VAC)

R = Vegetation regeneration potential (High potential raises VAC)

Example - not a plan (for illustrative purposes only)

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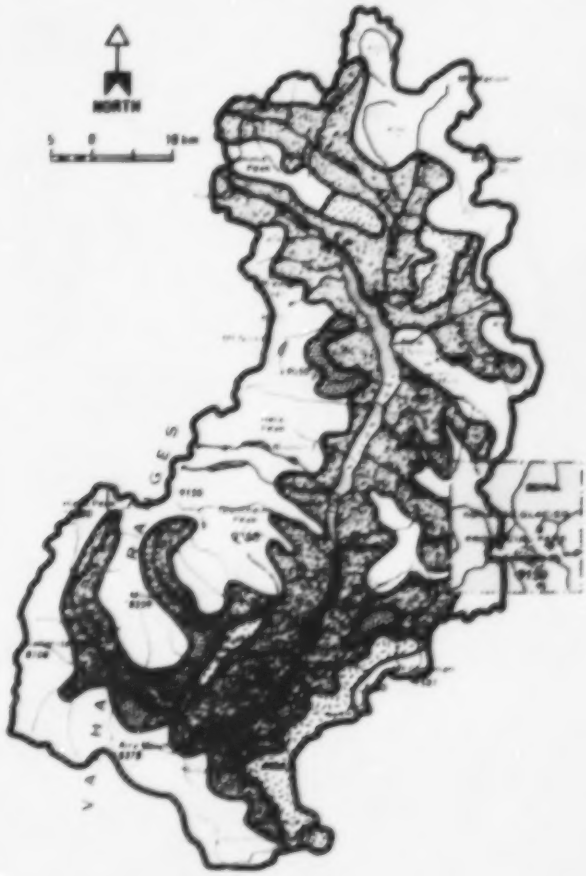
Class One	0 - 30%	
Class Two	30 - 60%	
Class Three	60% and above	

FIGURE 4.8(a) Slocan Valley VAC: Slope Class Analysis



Example - not a plan (for illustrative purposes only)

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High Productivity	
Moderate Productivity	
Limited Productivity	
Barren or Non-productive	

FIGURE 4.8(b) Slocan Valley VAC: Productivity and Vegetation Regeneration

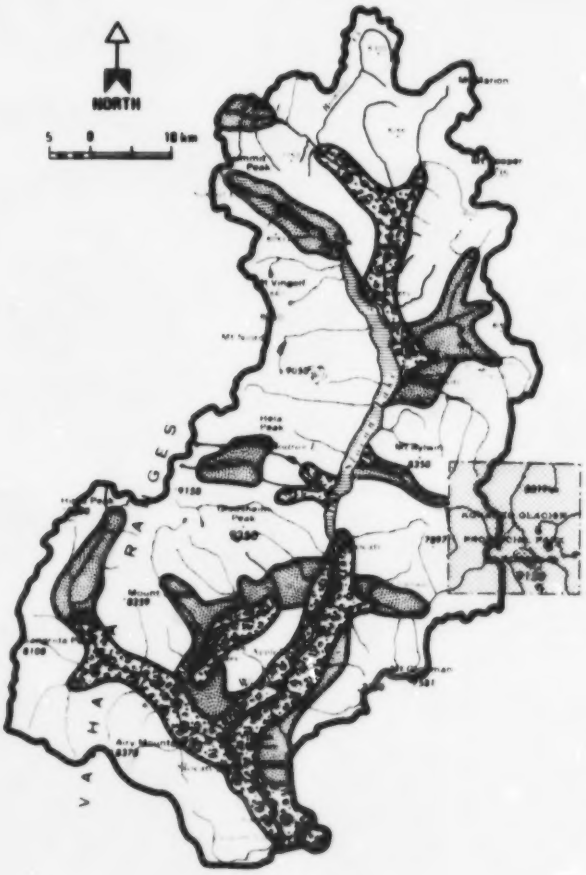


FIGURE 4.8(c) Slocan Valley VAC: Vegetation Pattern Diversity

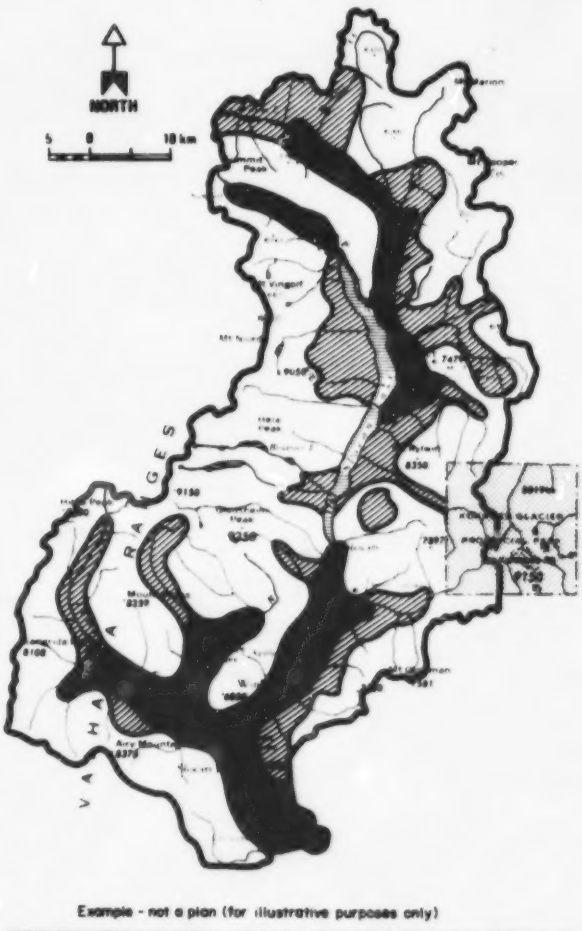


FIGURE 4.8(d) Slocan Valley VAC: Composite VAC Values

D = Vegetation diversity (The greater the diversity the greater potential for high VAC)

C = Potential soil and vegetation colour contrast (Too great a contrast lowers VAC by virtue of exposure to view)

Step Six: Draft final VAC overlay to visual assessment map in terms of high, medium or low VAC (Table 4.8). Recommended numerical assignments are translated as follows:

High VAC - 29-36
Moderate VAC - 20-28
Low VAC - 4-19

TABLE 4.6
RELATIVE IMPORTANCE OF VAC FACTORS (adapted from Blau, et al., 1979)

FACTOR	CHARACTERISTICS	VAC VALUES VERBAL	NUMERICAL
(s) Slope	Steep 60%+	Low	1 (multiplier)
	Moderately Steep: 30-60%	Mod	2 (multiplier)
	Relatively Flat: 0-30%	High	3 (multiplier)
(E) Soil stability & erosion potential	High constraint value derived from high erosion hazard and/or high instability hazard	Low	1
	Moderate constraint value derived from erosion hazard and/or instability hazard	Mod	2
	Low constraint value as above	High	3
(R) Vegetation regeneration potential	Low regeneration	Low	1
	Moderate regeneration	Mod	2
	High regeneration	High	3
(D) Vegetation diversity	Non-vegetated, grasslands or brush cover	Low	1
	Coniferous, deciduous, cultivated	Mod	2
	Diversified (mixed open and woodlands)	High	3
(C) Potential soil and vegetation colour contrast	High visual contrast between exposed soil and adjacent vegetation	Low	1
	Moderate visual contrast between exposed soil and adjacent vegetation (and all barren, cultivated and diversified vegetation types)	Mod	2
	Low visual contrast between exposed soil and adjacent vegetation	High	3

4.7 VISUAL IMPACT PREDICTIONS

Where assessments of proposed project impacts are being made with a specific project in mind, public awareness and sensitivity will likely be increased. Public value judgements may well be coloured by the threat of development. In these cases it must be made very clear whether the public or the professional involved is being asked to a) assess the inherent quality of the landscape itself, or b) assess the sensitivity of the landscape to a specific development.

In answer to the above, once VR Management Classes have been established by inventory and assessment, a considerable degree of guidance can be given proposed developments as they arise. Thus development can be avoided in highly sensitive areas or modified by specific design guidelines to reduce visual impacts. Visual impact predictions are important at this point to determine if a development should occur and where.

Visual impact predictions are based on the compatibility or misfit between development alternatives and the landscape's visual quality, i.e. its relative sensitivity to alteration of its inherent visual characterics by management activity. However, if descriptive inventory and assessment factors have not been pre-determined, visual impact predictions will be difficult to carry out.

There are four basic procedures for conducting visual impact predictions:

1. Contrast Ratings (as modified from BLM)
2. Establishing landscape control points
3. Computer graphics
4. Simulation

These procedures are discussed at some length in the following section.

4.7.1 CONTRAST RATINGS

Contrast ratings based on previous scenic quality evaluations reveal existing features and their respective elements that will be subject to the greatest visual impact. The degree of contrast with basic landscape patterns brought about by a specific development is the primary criterion for determining suitability or adaptability of such a proposal within each designated VR Management Class.

Contrast ratings should be made from key observation points (KOP) or points that will be commonly used by observers. The following factors are to be considered:

- Distance. Foreground site locations hold highest impact potentials.
- Angle of observation. As the angle nears 90 degrees it is most critical.
- Length of time during which proposed project will be viewed. There may be a need for short and long term objectives since some projects are self-mitigating, e.g., dam construction and strip mining.
- Relative size or scale created by projects.
- Season of year (indicating heaviest use).
- Lighting. Sidelighting is best for accurate contrast evaluation.

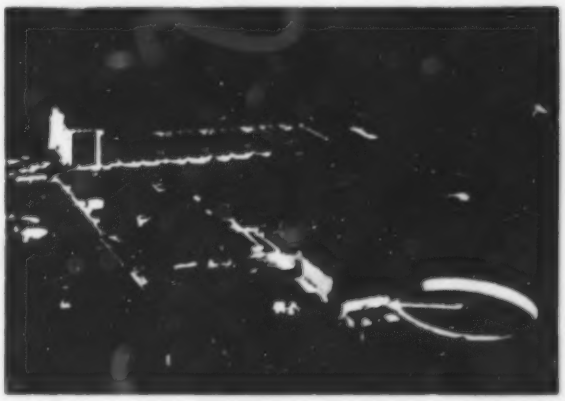


PLATE 4.21 This sewage treatment plant within VRMA 14-R meets Class III VR Management requirements. (B.C. Ministry of Environment photo) See page 62

TABLE 4.7

Proposed Field Form #1: Assigning Visual Contrast Ratings
(Modified from USDI Bureau of Land Management, 1980 and Sheppard et.al., 1979)

VISUAL RESOURCE CONTRAST RATING SHEET

Project Name: Sewage Treatment Plant — Date: 9-20-82

Location — Map: NTS 82F SE — Scale: 1:50 000

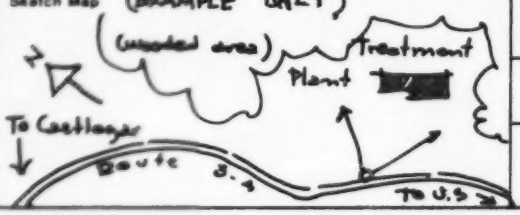
Regional District: Central Kootenay

Strategic Planning Area: Kootenay - Slocan

Section: _____ Range: _____ Township: _____

Longitude: 117-30 Latitude: 49-30

Sketch Map (EXAMPLE ONLY)



VRM: S. Columbia Mts.

Landscape Unit: Castlegar

Evaluated By: MJF

Checked By: P.Z.

Visual Resource Management Class: III

Key Observation Point: #1 of 2

Characteristic Landscape

	Element	Descriptors[1]	Comments
LAND/WATER	Form	Landform (3-D) water, soil pattern	Rolling to steep around site. Mod. Contrast
	Line	Regularity/continuity	Little hrz def. in landform: Irreg. Continuity
	Color	Soil, rock, ice, snow, hue, value, chroma	Grey to deep brown: glacial till over bedrock
	Texture	Clarity, grain	Soil texture not evident from KOP
	Scale	Landform/waterform mass and area	Landform subord. in f.g. but rises above site
VEGETATION	Form	Regularity, simplicity, orientation	Regular, simple, vertical: Dfir, WRC & aspen
	Line	Direction, regularity edge character	No riparian definition. Edges irregular
	Color	Hue, value, chroma	Hue deep green. Value medium. Chroma dull
	Texture	Clarity, grain	Course textured, dense, even ordered
	Scale	Size, area surrounding objects	Basic canif 2nd growth to 80 ft: not dominant
STRUCTURES	Form	Regularity, simplicity orientation	Simple, low profile & compact
	Line	Direction, regularity continuity, simplicity	Horiz. dominant: largely surfaced areas: blends well w/surroundings
	Color	Reflectivity, hue value, chroma	Grey to white hues; tanks have high chroma (white) Blends well.
	Texture	Clarity, grain	Textured conc. & untreated wood surfaces
	Scale	Size, height, width, surrounding areas	Observer above from KOP#1. Thus low VAC but low profile: not competetive w/surround
LANDSCAPE	General Description	Define characteristic landscape, regional setting etc.	Landscape unit dissected by Columbia R. strong topog. Interior wet belt
	Scale	Expansive, bounded, area enclosure; visual unit	Bounded strongly by rolling to rugged forested landscape
	Spatial Composition	Focal, feature enclosed, panoramic canopied; weak to strong	Site is moderately focal: is in fg of views of river, thus highly sensitivity to viewing

[1] Refer to Chapter II, Concepts (Adapted from USDI Bureau of Land Management, 1978 and Sheridan et al., 1980).

TABLE 4.8

Proposed Field Form #2: Establishing Contrast Rating Scores for Project Visual Impacts
(Modified from Sheppard et.al., 1979)

1

Relative Importance of Visual Elements in Contrast Ratings

Procedure:
Multiply weighting assigned to each visual element against degree or contrast, i.e., strong (3) moderate (2) weak (1) and none (0)

Visual Elements & Weighted Values	Introduced or Modified Components		
	Land/Water	Vegetation	Structures
Color Contrast (4x) Weighting	High 12 Moderate 8 Low 4 None 0	High 12 Moderate 8 Low 4 None 0	High 12 Moderate 8 Low 4 None 0
Form Contrast (4x) Weighting	High 12 Moderate 8 Low 4 None 0	High 12 Moderate 8 Low 4 None 0	High 12 Moderate 8 Low 4 None 0
Line Contrast (3x) Weighting	High 9 Moderate 6 Low 3 None 0	High 9 Moderate 6 Low 3 None 0	High 9 Moderate 6 Low 3 None 0
Texture Contrast (2x) Weighting	High 6 Moderate 4 Low 2 None 0	High 6 Moderate 4 Low 2 None 0	High 6 Moderate 4 Low 2 None 0
Scale Contrast (3x) Weighting	High 9 Moderate 6 Low 3 None 0	High 9 Moderate 6 Low 3 None 0	High 9 Moderate 6 Low 3 None 0

2

Overall Rating

To arrive at an Overall Rating one must review the Contrast Rating (box #1) and use the criteria listed below.

Overall High if 1-3 components high or 3 components medium

Overall Medium if 1-2 components medium with no higher ratings

Overall Low if 1-3 components low with no higher ratings

Overall None if all components None

	Overall Element Ratings	Overall Element Scores
Color	High 12 Moderate 8 Low 4 None 0	8
Form	High 12 Moderate 8 Low 4 None 0	8
Line	High 9 Moderate 6 Low 3 None 0	3
Texture	High 6 Moderate 4 Low 2 None 0	4
Scale	High 9 Moderate 6 Low 3 None 0	6
Total Contrast Score		29

3

Scale Dominance

Major object in confined setting	Dominate	12
One of several major objects or major object in an unconfined setting	Co-dominate	8
Significant object relative to setting	Subordinate	(4)
Small object relative to setting	Insignificant	0

Comments: Treatment plant could be brought more closely in line with Class III VRMA by additional screening from KOP #1

4

Composite Visual Impact Severity

Add the score from box #2 (Overall Contrast Rating) to the score from box #3 (Scale Dominance) to get the Composite Visual Impact Severity Number. Compare the CVIS Number with the accompanying table to choose the Sensitivity Class.

Composite Visual Impact Severity: 33

Class I and I(S2)	Negligible	0 - 11
Class II	Low	12 - 23
✓ Class III	Moderate	24 - 35
Class IV	Strong	36 - 47
Class V and V(R) and V(E)	Severe	48 - 60

5

Summary

Project Name: Sewage Treatment Plant

	Class	Severity	Score
Project Visual Impact	III	Mod.	33
Visual Resource Management Class Requirement (maximum)	III	24-35	

Does the project meet the Visual Resource Management Class Requirement?

Yes [X]

No [ ]

Assessor: [signature]

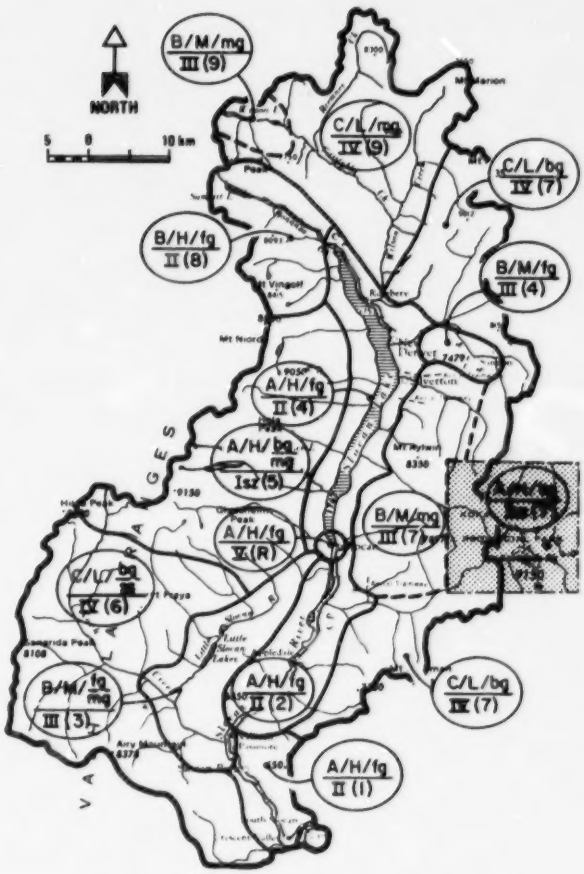
Date: 10-10-82

Each VR Management class describes a different degree of modification allowed in the basic elements of the landscape. The primary character of the landscape should be retained regardless of the degree of modification allowed.

A theoretical project will serve as an example. Plate 4.21 illustrates a sewage treatment plant within VRMA 14-B. The facility is in place but a proposal for its expansion has been initiated by the Regional District. The existing plant requires a visual contrast rating to determine whether or not it meets the requirements of VR Management Class 111, into which it falls.

Completing the proposed field form #1 (Table 4.7) for assigning visual contact ratings is the first step in the assessment. It sdhould be filied out in the field, where direct observations can reveal basic quality ilnformation relateed to form, line, colour, texture and scale. At this level of assessment, the characteristic landscape is defined in terms of descriptive inventory. This may or may not have been done for the entire VRMA.

These data are then related to the proposed project in terms of evident contrasts. VRMA Field Form #2 (Table 4.8) is used for this purpose. Usingf this form, the sewage treatment plant is compared with existing site conditions, element by element, feature by feature according to the degree of contrast involved, e.g. strong = 3, moderate = 2, low = 1 and 0 = no contrast. Thus the element's weighted value multiplied by the degree of contrast equals the magnitude of visual impact. Weighted values for each element (form, line, color, texture and scale) are based on its significance in the landscape as determined by scenic quality levels, sensitivity levels and distance zones. For example, in this case the sewage treatment plant contrasted moderately (2) with the surrounding landforms (4) for a rating of 2 x 4, or 8, while it contrasted strongly (3) in texture (2) with the surrounding vegetation for a rating of 2 x 3, or 6 (Table 4.5).



Example - not a plan (for illustrative purposes only)

Legend

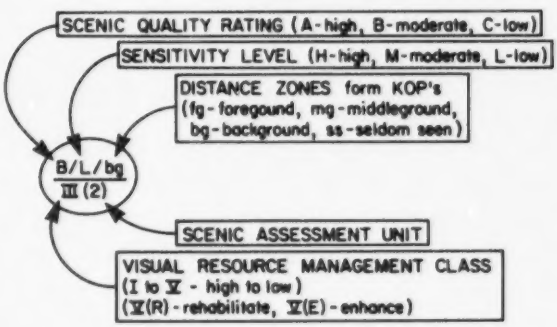

SCENIC QUALITY RATING (A-high, B-moderate, C-low)
SENSITIVITY LEVEL (H-high, M-moderate, L-low)
DISTANCE ZONES form KOP's (fg-foregound, mg-middleground, bg-background, ss-seldom seen)
B/L/bg III (2)
SCENIC ASSESSMENT UNIT
VISUAL RESOURCE MANAGEMENT CLASS (I to V - high to low) (V(R)-rehabilitate, V(E)-enhance)

FIGURE 4.9 Slocan Valley Landscape Unit: Management Class Structure - A Summary Map

A composite score of contrasts with all elements indicated the degree of magnitude of impact occasioned by the proposed development.

Contrast rating scores as outlined can be related to VR Management Classes by assigning maximum and minimum allowable rating scores within each class. Table 4.6, "VR Management Class Requirements" is used for this purpose. If the composite visual impact rating score, (tabulated summary on Field Form #2 as a sum of overall element ratings and scale dominance factors) is too high to be accomodated in the Management Class, the project must be modified by design, re-located in a lower VR Management Class area or disallowed. In the example shown, severity was judged "moderate" with a total impact score of 33. Since Management Class 111 requirements range from 24 to 35, the project is acceptable.

It is important to note that visual contrast rating assignments as outlined above will vary within each VRMA and cannot be categorically specified for the province at large until adequately field tested under actual conditions.

4.7.2 LANDSCAPE CONTROL POINTS[1]

One effective system for office and field-checking probable impacts of development on the visual resource is by establishing landscape control points (Litton, 1973). In this method, a set viewpoint from which the landscape would normally be seen is established and mapped. Drawings from this point can be made and used to predict changes. Basically, the method involves setting up cross-sectional diagrams from a point or points of observation to the subject area to determine seen and unseen areas.

As with contrast ratings, it is essential in this system to establish KOPs , or points from which the proposed development would be seen by the greatest number of people for the greatest period of time. Lines are then drawn on the map from one or several KOP's (Figure 4.10) to ridgelines or

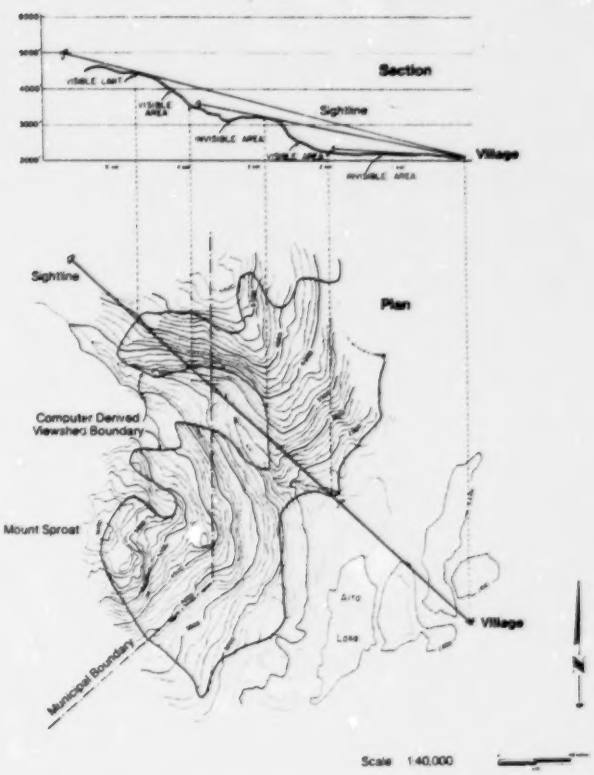


FIGURE 4.10 Landscape Control Points (Adapted From B.C. Forest Service. Landscape Handbook, 1982)

points of highest elevation within the line of vision. A vertical scale is then made of points of intersection, with contours plotted in section. This should reveal areas seen and not seen from each KOP at a topographical level. Tree heights must then be estimated to give a more precise definition of seen or unseen areas. This information can be gained from forest cover maps, obtainable from the B.C. Ministry of Forests.

The main difficulty with the landscape control point system lies in the time required for

[1] Synonymous with Key Observation Points (KOP) as outlined in the User Guide.

drawings, both in the field and office. However, until more areas in British Columbia are digitized for computer entry the Landscape Control Point System remains a viable method for assessing visual impact predictions in conjunction with field contrast ratings and VAC studies. (For a more detailed outline of the system see Litton, 1973).

4.7.3 COMPUTER ASSISTED PROGRAMS

Computer graphic systems now available for illustrating viewed areas, times seen and impact frequencies include the following: Viewit, Preview, Perspective Plot and Mosaic.

Viewit is capable of delineating terrain visible from both single and multiple observer points, demonstrating viewed areas, times seen and impact frequencies (Travis, Elsner et al., 1975). It can also depict slope and aspect data in varying degrees of shaded patterns.

FIGURE 4.11 Viewit: An Example of Application

Perspective Plot is used largely for selection of cut blocks in forested areas where visual imapct can be determined from varying observer points and from different azimuth angles (Twito, 1978). It places the proposed cut block in perspective outline by tree symbols and is highly manipulative. This program is written specifically for use on desktop computer systems such as the Hewlit - Packard 9845 or Wang 2200 LVP. The system has been further developed to depict utility poles and lines, road cuts, water storage areas and similar projects where ditigal control can be obtained (see Nickerson, 1980).

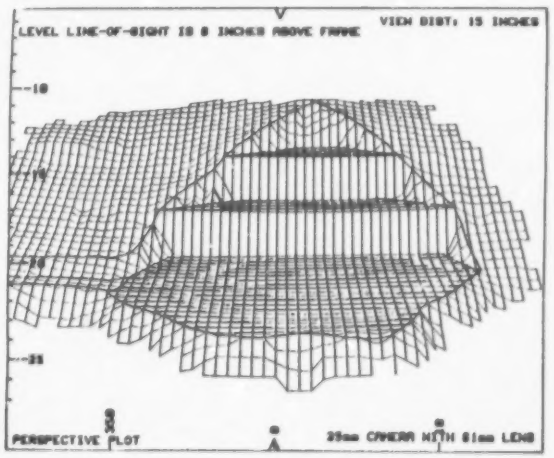


FIGURE 4.12 Perspective Plot: An Example of Application

Preview, in addition to rendering perspective diagrams from digitized data, is capable of graphically illustrating vegetative cover, rock outcrops, water bodies and ground cover as well (Myklestad et al., 1976). It has proven useful in selection of suitable ski slopes, borrow pits, road locations and cut block proposals.

FIGURE 4.13 Preview: An Example of Application in British Columbia (Source: Angelo, 1979)

4.7.4 SIMILATION

Visual predictions may also be made through simulation, which can either be photographic or mechanical, and often combines well with computer graphics.

In this rapidly developing field, actual, predictable results of placing a management activity within the landscape can be seen (Blair, 1981). Black and white, or preferably colour, photographs of the project area are projected and enlarged on a screen. The proposed development can then be drawn onto the enlarged screen or photographic format, or another photograph of the proposal superimposed on the area photo. In large areas contrast ratings, coupled with simulation and computer graphic displays, can be very effective determinants of probable impact levels.

PLATE 4.22 Visual impacts of cuts, fills and alignment can be simulated by computer graphics if digital terrain data is available

The use of visual simulation methods in British Columbia has been minimal, due largely to the lack of a digitized contour data base and limited technical experience with the system. Figure 4.13 illustrates the recent use (1979) of Preview for simulation of a proposed ski development. In a more recent example, the B.C. Parks and Outdoor Recreation Division employed photography, sketches and balloon-assisted simulation to graphically depict the visual effect a proposed power transmission line would have within an existing park area. Figure 4.14 (top) is a sketch of the area as it presently exists. Figure 4.14 (bottom) is a simulation of the same area as it would likely appear after clearing, grading and installation of power poles. Clearing widths and pole locations were obtained from Provincial highway and B.C. Hydro engineers and located in the field. Actual pole heights were then simulated by the use of balloons, which were released at each pole location, then allowed to rise to the actual pole height. Photographs were taken of the simulation and later translated to sketch form as noted.

The above system is less costly than computer assisted methods but limited to projects where digital information is either unavailable, inappropriate or unnecessary. Its main value lies in depicting above-ground vegetation and structures with scale and perspective accuracy beyond that of such systems as Perspective Plot, and Preview which depict trees, rocks and objects in symbolic form only. More specific current and past project information may be obtained from the B.C. Parks and Outdoor Recreation Division, the British Columbia Institute of Technology (Angelo, 1979) and the School of Forestry, University of British Columbia (Young, 1978).

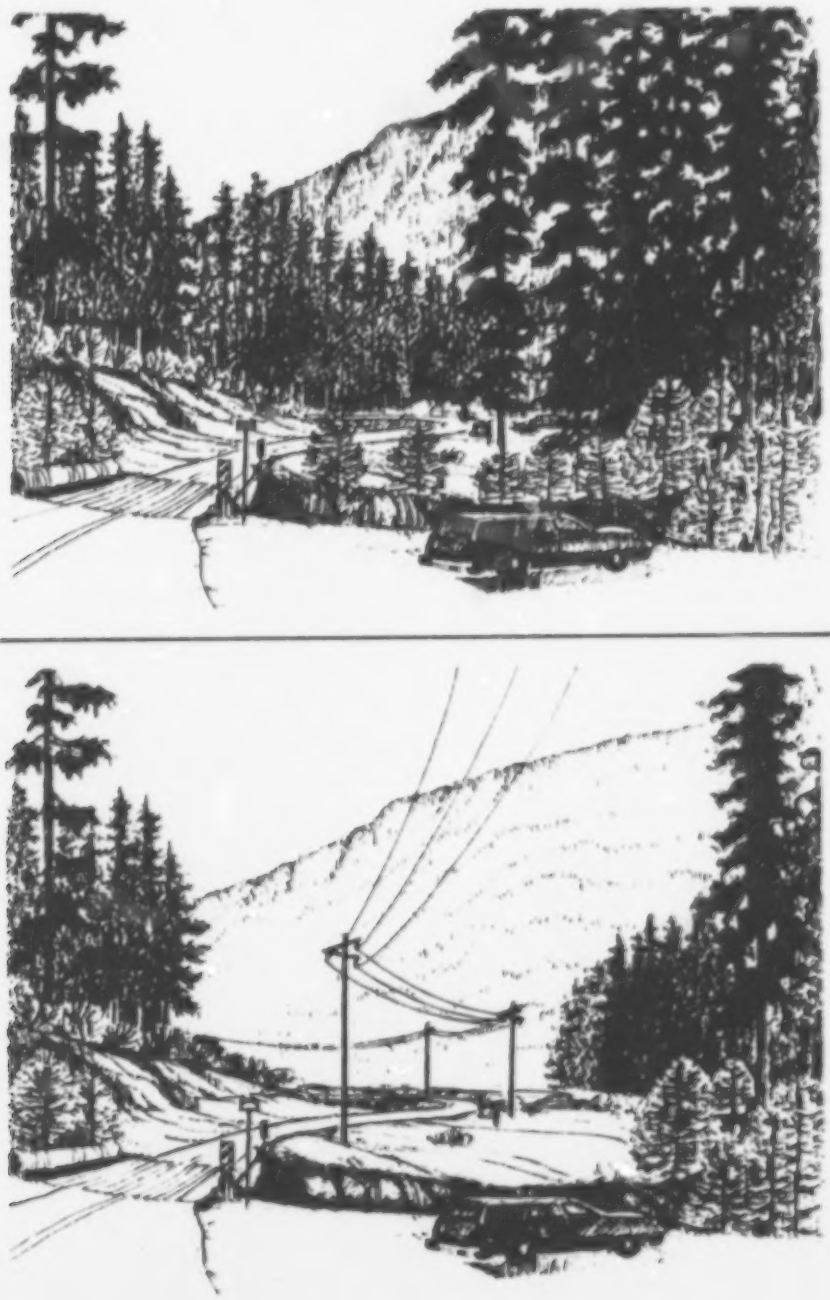


FIGURE 4.14 Simulation Technique: An Example of Application in British Columbia (Original Drawings by Rina Pita)

4.7.5 SUMMARY

Although the four methods of determining visual impact predictions appear to be fragmented and somewhat complex they are not unrelated. Basically the Contrast Rating System can be given greater objectivity by supplementing assigned and weighted values with the other three methods, depending upon the nature, scale and intent of the proposed activity and its consequent impact. Developing rating skills in contrast estimation is the key to conducting effective visual impact predictions. This skill can only be gained by actual on-the-ground applications of methodologies outlined.

Man survives by taking in four kinds of nourishment: food, water, air and impressions of his environment (Ouspensky, 1968).

Chapter Separator Photo

PLATE 5.1 Early morning mists rise over fenced meadows in this rural B.C. scene. (B.C. Ministry of Environment photo)

5 MANAGEMENT OPTIONS

In the final analysis, decisions to allow or disallow development in visually sensitive areas are essentially political but based on economic factors as well. This may, and often does, present problems where aesthetics are not given sufficient consideration. Thus it is of great importance that descriptive inventory and subsequent visual evaluations portray the consequence(s) of any development as they will affect visual quality - in economic as well as aesthetic terms. Management must then exercise options for its placement in the landscape. In some cases, for example, a transmission line right of way or coal extraction operation places little demand upon a landscape rarely seen or one sufficiently diverse to carry the operation with little visual impact. At other times various management options will need to be reviewed. These fall into the following general categories: mitigation, enhancement, rehabilitation, alternate site locations, or disallowance of the project. In all instances it should be the aim of the visual analyst to work toward accommodation of development in the landscape with as little disturbance as possible to its natural qualities and in accordance with provincial and regional requirements since such development may well be necessary and desirable for our economic and social well being.

5.1 MITIGATION

This option can usually be carried out by means of project design. A harsh exterior can be softened by wood or masonry reflecting the colour, hue and intensity of the surrounding landscape. Storage tanks can be painted, utility towers modified, vertical buildings reduced in scale. Architectural, engineering and landscape architectural treatments may often be the only requirements needed to bring the proposed development up to acceptance within the specified minimal management class requirement. Cost factors may preclude such treatment, in which case compensation will be required. (See B.C. Environment and Land Use Committee, 1980, and B.C. Ministry of Energy, Mines and Petroleum Resources, 1982, for clarification of energy and linear development application procedures in British Columbia).

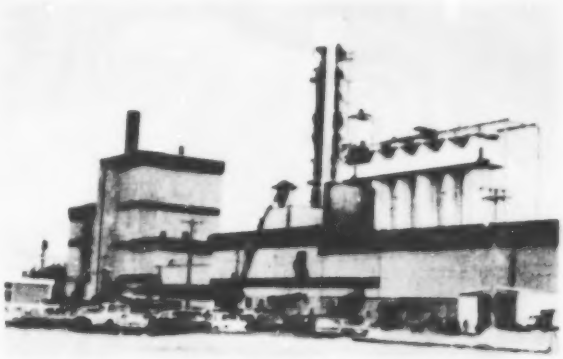


PLATE 5.2 Structural harmony and carefully textured surfaces combine to mitigate the visual impact of this industrial complex. (B.C. Ministry of Environment photo)

PLATE 5.3 The southern approach to Cranbrook could be greatly enhanced by the introduction of vegetation screening and ground cover

5.2 ENHANCEMENT

Another option is enhancement of visual attributes of a project or project area by design

or improvement of existing site conditions. For example, additional visual interest can be created by introducing vegetation to soften harsh edges, removing it at critical viewpoints and, in some cases, by screening. Highway access routes can be visually enhanced with native plantations along median strips, by blending cut-banks with adjacent landforms and through design of alignments to create variety and interest (Alberta Transportation, 1980).

5.3 REHABILITATION

Rehabilitation differs from enhancement since it is directed toward site recovery rather than being additive. For example, where surface mining disturbs the visual quality of an area, rehabilitation to a point approximating original site or area conditions should be required. Another example would be scarifying and re-seeding or replanting old logging, mining or transmission line access routes when they have ceased to be functional. Filling and revegetating depleted gravel borrow pits and other by-products of development are additional examples of such efforts (See Environment and Land Use Committee, B.C. Guidelines for Coal Development, 1976).

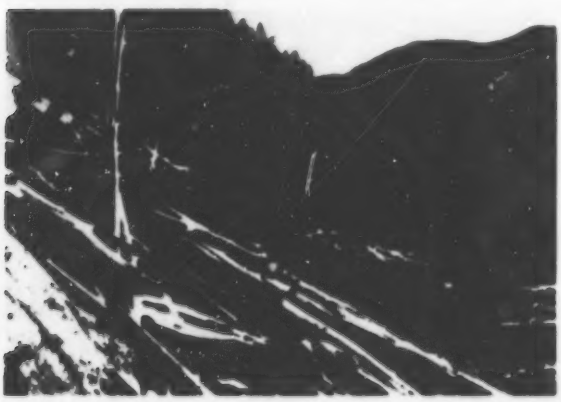


PLATE 5.4 This B.C. storage reservoir site is in need of rehabilitation from a Class IV to a Class III VR Management Area. (B.C. Ministry of Environment photo)

5.4 ALTERNATE SITE LOCATIONS

Where development places serious visual constraints on an area and is highly visible from key observation points, road crossings, public park and recreation lands and other heavily used areas, alternate site locations must be reviewed for their suitability to accommodate the development. For example, in their Stage One studies for transmission line locations, it is the policy of B.C. Hydro to analyze a series of alternate routings. These are reviewed by concerned government agencies for their relative impacts on forestry, wildlife, recreation and other social and economic factors. Geotechnical and physiographic limitations are incorporated in the studies as well. Visual impact is one of these concerns; particularly where transmission lines and access roads would have a high visual profile from road crossings, and high use populated areas. Final route selections may not always be optimal solutions, but the process involved in their selection is valid.

PLATE 5.5 Urban expansion threatens farm land "edge" quality near Armstrong, B.C. Alternate siting to a less sensitive area is required

In any event each alternative, regardless of the nature of the proposed development, should undergo an inventory and evaluation process equal

to that conducted during the original site proposal and assessment. Visual simulation, computer graphics, contrast ratings and visual absorption capability studies are all valuable aides in selecting alternate sites for locating developments in visually sensitive environments.

5.5 DISALLOWANCE

In most cases, management activities can be accommodated in the landscape through the design process or by alternate site location with little or no consequent visual impact. They can, in fact, be positive, adding to visual interest where little may have existed beforehand. However, where all efforts toward design enhancement, rehabilitation and alternate siting fail to meet established sensitivity class standards and/or where public reaction is too severe, the management activity may be disallowed. Either the activity must await technological means to mitigate its visual impact or a time when public and political attitudes are more amenable to its acceptance. The latter is evident in situations where health hazards (e.g., acid rain, air pollution), induced by the activity (e.g., uranium strip mining, thermal coal operations) are tolerated yet in visual and environmental terms the effects are unacceptable.

5.6 SUMMARY

Any of the above management options will be required to undergo a project review process involving evaluation of maps, documents, public attitudes, etc. prior to making recommendations to the decision making body. (Appendix C outlines a constructive approach to this process).

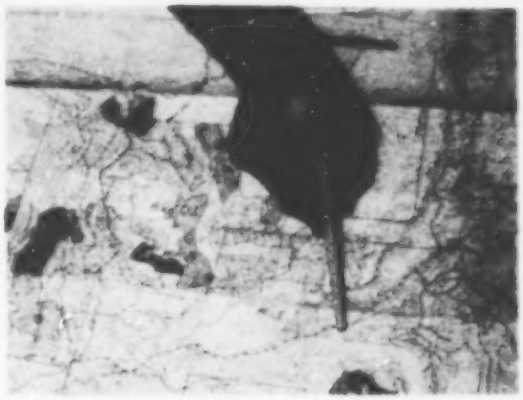


PLATE 5.6 Each alternative should undergo descriptive inventory and visual assessment procedures prior to final consideration

The visual resource is but one of a number of other resources involved in that decision. It is essential that it be given as full a hearing as the others. This can only happen if it is documented and evaluated as thoroughly as possible at the time other resource disciplines are investigated. This will insure that the visual analyst will gain a more holistic view of his concern as it relates to other social and economic studies. It will also, in turn, acquaint other members of the study team with the degree to which visual analysis may or may not relate to their own special interests.

REFERENCES

Ady, John, Brian Dray, and Grant R. Jones. 1979. A Visual Resource Management study of Alternative Dams, Reservoirs and Highway and Transmission Line Corridors near Copper Creek, Wash. In Proc., Our National Landscape. USDA Forest Service Gen. Tech. Report PSW-35, pp. 590-597.

Alberta Transportation 1980. Alberta Roads: Environmental Design Guidelines. Alberta Environment, Calgary, Alta, 78 pp.

American Society of Landscape Architects. 1978. Creating Land for Tomorrow; Under Contract to SEAM - Surface Environment and Mining, Forest Service USDA, 45 pp.

Anderson, Lee, Jerry Mosier, and Geoffrey Chandler. 1979. Visual Absorption Capability. In Proc., Our National Landscape. USDA Forest Service Gen. Tech. Report PSW-35, pp. 164-171.

Andrews, Richard N.L. 1979. Landscape Values in Public Decisions. In Proc., Our National Landscape; USDA Forest Service Tech. Report PSW-35, pp. 686-692.

Angelo, Mark. 1979. The Use of Computer Graphics in the Visual Analysis of the Sunshine Ski Area Expansion. British Columbia Institute of Technology, Burnaby, B.C., 9 pp.

Bauer, Wolf. 1974. The Shore-Process Corridor: Its Anatomy, Function and Basis for Shoreland Planning and Management. Oregon Coastal Conservation and Development Commission, 12 pp.

Bird, Brian J. 1972. The Natural Landscapes of Canada - A Study in Regional Earth Science. Wiley Publishing, Toronto, Ont.

Blair, William. 1981. Visual Assessment for Highway Projects. U.S. Department of Transportation, F.H.A. Washington, D.C., 89 pp.

Blau, David H, Michael C. Bowie, and Frank Hunsaker. 1979. Visual Resources Inventory and Imnaha Valley Study: Hells Canyon National Recreation Area. In Proc., Our National Landscape, USDA Forest Service Gen. Tech. Report PSW-35, pp. 428-438.

Block, J. and Valerie Hignett. 1982. Outdoor Recreation Classification for British Columbia. B.C. Ministries of Environment and Lands, Parks and Housing, Victoria, B.C. APD Bulletin #8, 133 pp.

Block, J. 1978. Visual Analysis, Bowen Island, B.C., In Bowen Island: A Resource Analysis for Land Use Planning, Vol. I, Chapter Seven and Vol. II, Appendix E, Ministry of Environment British Columbia, Resource Analysis Branch, 97 pp.

Chamberlin, T. 1980. Aquatic System Inventory. B.C. Ministry of Environment APD Tech. Paper #1. 32 pp.

Craik, Kenneth. 1968. The Comprehension of Everyday Physical Environment. Journ of Amer. Inst. of Planners, 34/29/37.

Daniels, T.C. and R.S. Boster. 1976. Landscape Aesthetics: The Scenic Beauty Estimation Method. USDA Forest Service Paper RM 1-67.

Demarchi, Dennis A. 1983. Biotic Regions of British Columbia - An Ecological Land Classification for Fauna (in process).

Environment and Land Use Committee, British Columbia.
_____1976. Guidelines for Coal Development.

_____1977. Guidelines for Linear Development. 32 pp.

_____1979. Guidelines for Regional Resource Management Committees.

_____1979. Approvals Procedures for Land Development.

_____1980. Environmental and Social Impact Compensation/Mitigation Guidelines.

EDAW Inc., Allen Lind and Stephen S.R.J. Sheppard. 1981. Aesthetic Resource Evaluation of the California Coastline. In POCS Technical Paper 81-5, U.S.D.I. Bureau of Land Management, pp. 114-147.

Fenneman, Nevin M. 1931. Physiography of the Western United States. McGraw-Hill Book Co., New York, 534 pp.

Fraser, B. 1982. Public Involvement Handbook. B.C. Ministry of Forests, 134 pp.

Holland, Stuart S. 1964. Landforms of British Columbia - A Physiographic Outline. Bulletin #48, British Columbia Dept. of Mines and Petroleum Resources, 138 pp.

Horner, Roger. 1982. Visual Resources of the Northeast Coal Study Area, 1977-1978. APD Bulletin #23. Surveys and Resource Mapping Branch, B.C. Ministry of Environment, Victoria, B.C., 115 pp

Howes. D., and E. Owens. 1982. Physical Shoreline Classification for B.C. TSB Draft., B.C. Ministry of Environment, Victoria, B.C.

Jones and Jones, Architects and Landscape Architects, Seattle Wash. 1977. Aesthetics and Resource Management for Highways. Sponsored by U.S. Dept. of Transportation, Washington, D.C., 139 pp.

Kaplan, Rachel. 1975. Some Methods and Strategies in the Prediction of Preferences. In Landscape Assessment: Values, Perceptions and Resources, pp. 118-129. Dowden, Hutchinson and Ross, Stroudsburg, PA.

Kell, Gary W. 1979. Project Visual Analysis for the Alleghany Nat'l Forest. In Proc., Our National Landscape. USDA Forest Service, Gen. Technical Report PSW-35, pp. 565-571.

Lee, Michael S. 1979. Landscape Preference Assessment of Louisiana River Landscapes In Proc., Our National Landscape, USDA Forest Service Gen. Tech. Report PSW-35, pp. 572-580.

Litton, R. Burton Jr.

_____1972. Aesthetic Dimensions of the Landscape. Ch. VIII of Natural Environments, Edited by John Kutilla. Resources for the Future, Washington, D.C.

_____1973. Landscape Control Points: A Procedure for Predicting and Monitoring Visual Impacts. USDA Forest Service Research Paper PSW-91, 22 pp.

_____1974. Visual Vulnerability of Forest Landscapes. Reprint from Journ. of Forestry, 72:7, July 1974, 6 pp.

_____1976. Personal Communication to the author. Quoted in part.

_____1979. Descriptive Approaches to Landscape Analysis. In Proc., Our National Landscape, USDA Forest Service Gen. Tech. Report PSW-35, pp. 428-438.

Litton, R. Burton Jr. and Robert Tetlow. 1978. A Landscape Inventory Framework: Scenic Analysis of the Northern Great Plains. USDI Forest Service Research Paper PSW-135, 83 pp.

Litton, R. Burton, Jr. Robert Tetlow, Jens Sorenson, and Russel A. Beatty. 1974. Water and Landscape: an Aesthetic Overview of the Role of Water in the Landscape. Water Information Centre, Port Washington, New York, 314 pp.

McHarg, Ian. 1969. Design with Nature. The Natural History Press, Garden City, N.Y., 197 pp.

Mills, Louis V. 1979. Visual Resource Management of the Sea. In Proc., Our National Landscape; USDA Forest Service Gen. Tech. Report PSW-35, pp. 717-723.

Ministry of Energy, Mines and Petroleum Resources. British Columbia. 1982. Guide to the Energy Review Process, 32 pp.

Ministry of Environment, British Columbia, Assessment and Planning Division. 1981. APD Catalogue 81, 96 pp.

_____1977. Surveys and Resource Mapping Branch. Terrain Classification System, 54 pp.

_____1982. Terrestrial Studies Branch APD Bulletin 28. Biophysical Resources of the Slocan Valley, O.R. Travers Coordinator, 182 pp.

Ministry of Forests, British Columbia. 1981. Forest Landscape Handbook. W.H. Van Heek, Coordinator, 96 pp.

Ministry of Lands, Parks and Housing, British Columbia; Parks and Outdoor Recreation Division. 1982. Natural Regions and Regional Landscapes for the British Columbia Park Systems. Unpublished draft.

Myklestad, E. and J.A. Wager. 1976. Preview: Computer Assistance for Visual Management of Forested Landscapes. USDA Forest Service Research Paper NE-355, 14 pp.

Nickerson, Devon B. 1980. Perspective Plot: An Interactive Technique for the Visual Modeling of Land Management Activities. USDA Forest Service PNW Range and Experiment Station, 146 pp.

Ontario Ministry of Natural Resources. 1977. Ontario Provincial Parks Design, Principles and Standards, 58 pp.

_____1977. Frank MacDougall parkway Study, Algonquin Provincial Park, 82 pp.

_____1980. French River Canadian Heritage Waterway Plot Study: Landscape Evaluation, 62 pp.

Ouspensky, P.D. 1968. The Fourth Way. Alfred A. Knopf, New York, 437 pp.

Pearce, Joseph Chilton. 1971. Crack in the Cosmic Egg. Washington quare Press. 145 pp.

Scheele, Robert and Gary Johnson. 1979. The Mt. Mitchell Scenery Assessment. In Proc., Our National Landscape. USDA Forest Service Gen. Tech. Report. PSWW-35, pp. 124-135.

Secter, Jon. 1979. Shore Policy for British Columbia: Unpublished white paper prepared for the B.C. Ministry of Environment, Assessment and Planning Division.

Shafer, E.L. and Michael Tooby. 1973. Landscape Preferences, an International Replication. Journal of Leisure Research 5(3); 60-65.

Sheppard, S.R.J. and S. Newman. 1979. Phototype Visual Assessment Manual. Department of Landscape Architecture, University of California and School of Landscape Architecture, College of Environmental Science and Forestry, State University of New York, Syracuse, New York, 84 p.

Stone, Edward. 1978. Visual Resource Management. L.A. Technical Series, American Society of Landscape Architects, Washington, D.C.

Tetlow, Robert and Steven S.R.J. Sheppard. 1977. Visual Resources of the Northeast Coal Area. Resource Analysis Branch, Ministry of Environment, British Columbia, 104 pp.

Travis, M.R., Gary Elsner, W. Iverson and C.G. Johnson. 1975. Viewit - Computation of Seen Areas, Slope and Aspect for Land Use Planning.

USDA Forest Service General Tech. Report PSW 11, 70 pp.

Twito, Roger H. 1978. Perspectives - Plotting Landscape of Clearcuts. USDA Forest Service General Tech. Report PNW-71. 26 pp.

University of Michigan, School of Natural Resources. 1967. Mannistee, A Design Approach to Recreation Development. Prepared for USDI Forest Service, Washington, D.C.

Unwin, K.I. 1975. The Relationship of Observer in Landscape Evaluation. In Transactions of Institute of British Geographers, 66:130-134.

USDA Forest Service. 1974. National Forest Landscape Management, Vol. 1. U.S. Sup't of Documents, Washington, D.C., 76 pp.

_____1972. U.S. Forest Service Handbook, 64 pp.

_____1978. Manual Transmitted Sheets, Visual Contrast Ratings, Form 1221-2.

_____1979. Our National Landscape: A Conference on Applied Techniques for Analysis and Management of the Visual Resource. Gen. Tech. Report PSW-35, 752 pp.

U.S.D.I. Bureau of Land Management. 1980. Visual Resource Management Program, 39 pp.

_____1980. Visual Simulation Techniques, 38 pp.

Yeomans, W.C. 1977. Proceedings, Visual Analysis Workshop, Parksville, B.C. Resource Analysis Branch, Ministry of Environment, British Columbia, 50 pp.

_____1977. Spallmacheen: The Visual Environment. B.C. Land Comm. 88 pp.

_____1979. A Proposed Biophysical Approach to Visual Absorption Capability. In Proc., Our National Landscape, USDA Forest Service Gen. Tech. Report PSW-35, pp. 172-182.

Yeomans, W.C., Editor. 1978. Adams River. A Resource Analysis (with supplement). Surveys and Resource Mapping Branch, Ministry of Environment, British Columbia, 83 pp.

Young, G.G. 1978: The Application of Digital Terrain Simulators to the Planning of Forest Operations. In Proc., INTERFORST 78, Munich.

Zube, Irvin H. 1974. Cross-disciplinary and Intermode Agreement in the Description and Evaluation of Landscape Resources. Environment and Behavior 6/69/89.

Zube, Brush and Fabos. 1975. Landscape Assessment: Values, Perceptions and Resources. Dowden, Hutchinson and Ross, Stroudsburg Pa., 367 pp.

Chapter Separator Photo

PLATE A.1 Marsh grass and mountains meet in this B.C. interior lake reflection pattern. (B.C. Ministry of Environment photo)

APPENDICES

APPENDIX A. GLOSSARY OF TERMS

Adverse Visual Impact: any impact on the land or waterform, vegetation, or any introduction of a structure which negatively changes or interrrupts the visual character of the landscape and disrupts the harmony of the natural elements

Aesthetic(s):

(a) Generally, the study, science, or philosophy dealing with beauty and with judgements concerning beauty

(b) Giving visual pleasure

(c) The theory of perception or of susceptibility

(d) The quality of being esthetic is not the opposite of the qualities of "practicality" or "reality", but rather another aspect or way of experiencing the same real world phenomena. Thus, blue skies, uncontaminated water and uncluttered urban landscapes all have aesthetic value, because they imply health, pleasure and security

(e) In terms of visual assessment, aesthetics can be thought of in three primary aspects: (1) internal, (2) relational, and (3) extended environmental aesthetics (Blair, 1981)

Internal Aesthetics

Three questions must be answered in regard to the internal aesthetics of a project:

1. does the project design visually express its internal functions i.e., is it clear to the observer what that function symbolizes in the landscape?
2. Are details of the project visually consistent with one another?
3. Are there other aspects of internal aesthetics that vary with the nature of the project? For example, a scattered undefined cluster of buildings generally creates a sense of disorder and confusion in the observer.

Relational Aesthetics

This term refers to the visual relationships between a project and specific elements of its surroundings. For example, although some degree of contrast is needed for highway informational signing, the contrast may be too extreme in terms of colour or line. Signs may also block out important scenic views. Relational aesthetics are largely controlled by community approval of the proposed project, provided the information is adequate for review in the planning stage.

Environmental Aesthetics

In addition to the above, a proposal to alter the landscape may also affect the surrounding regional environment, often outside the study area itself. This involves extended environmental aesthetics, the third area of project concern. Consequent effects may be to enhance the quality of the total environment, decrease its quality or in some instances have no effect whatsoever.

Angle of Observation: the vertical angle between a viewer's line of sight and the slope or object being viewed

Background: the distant part of a landscape, picture, etc.; surroundings, especially those behind something and providing harmony or contrast; surrounding area or surface; an area located from 5-8 km to infinity from the viewer. (See "Distance Zones")

Back Lighting: See "Lighting"

Basic Elements: the four major elements (form, line, colour, and texture) which determine how the character of a landscape is perceived. Two additional elements are postulated (Smardon et. al., 1982) in the User Guide;

scale and spatial quality

Characteristic Landscape: the established landscape within an area being viewed; not necessarily naturalistic in character; could refer to a farming community, an urban landscape, a primarily natural environment, or other landscape which has an identifiable character

Colour: the property of reflecting light of a particular wavelength that enables the eye to differentiate otherwise unidentifiable objects

Commemoration: landscapes and special districts formally or informally recognized for their connection with past events; the visual quality, character, or information of these settings may have acquired cultural value beyond that revealed in an assessment based strictly on visual resources.

Complexity (Visual): complexity is a product of landscape diversity and viewer experience. Most observers seek a degree of complexity that stimulates interest, pleasure and possible excitement, but is neither too complex nor too monotonous. Edge complexity is an extremely important visual attraction and sustains high interest. Complexity can also be disruptive within the transition area between urban and rural ares where elements introduced by man can have little regard for blending with the surrounding landscape.

Computer Graphics: Visual displays of information produced by an electronic computer which includes both hard-copy and cathode-ray tube.

Contrast: diversity of adjacent parts, as in colour, tone, or emotions; the closer the juxtaposition of two dissimilar perceptions, in time or space, the more powerful the appeal to the attention.

Contrast Rating: a method of determining the extent of visual impact for an existing or proposed activity that will modify any landscape feature (land and water form, vegetation, and structures)

Critical Viewpoint: the point(s) commonly in use or potentially in use where the view of a management activity is the most disclosing. See "Key Observation Point".

Cultural Modification: any man-made change in land, waterform or vegetation (roads, bridges, buildings, fences); the addition of a structure which creates a visual contrast to the natural character of a landscape; a negative cultural modification disharmonious with the existing scenery; a positive cultural modification which can actually complement and improve a particular scene by adding variety and harmony

Cultural Significance: specific landscape settings may be significant because of cultural values. The setting must be at least briefly examined in its regional and national contexts to determine if it is culturally significant. Three general criteria are: uniqueness, commemoration, and designation

Designation: landscapes and special districts formally or informally recognized for their historic, educational, scientific, recreational, or aesthetic value. Designation may affect viewer expectations about these areas

Design: a deliberate plan or scheme to arrange elements in such a manner that a desired pattern results

Deviation: alteration of the characteristic landscape by a management activity. Deviations can be both positive (adding to visual interest) and negative (detracting from visual quality)

Distance Zones: three conventional terms in painting - foreground, middleground, background - which can be helpful in describing distance relationships. In landscape terms they are:

(a) Foreground (0 to 1/2 - 1 km): That area which can be designated with clarity and simplicity not possible in middle and background because the observer is a direct participant of immediate details - bark pattern, boulder forms, or degraded parts; a zone of important linkage where intensity of colour and its value will be at a maximum level, lacking the effect of colour diminution due to atmospheric scattering of light rays

(b) Middleground (1/2 - 1 km to 5 - 8 km); a critical area for two reasons: (1) this is where the parts of the landscape can be seen to join together, where hills become a range or trees make a forest, and (2) also where man-made changes may be revealed as sitting comfortably upon the landscape or where conflicts of form, colour, shape, or scale show up; where colours will be unmistakable but more blue and softer than those in the foreground; where the sharpness of value contrasts will be reduced

(c) Background (5.8 km to infinity); that area where distance effects are primarily explained by aerial perspective; where surfaces of land forms will lose detail distinctions and emphasis will be on outline or edge; where silhouettes and ridges of one land mass against another are the conspicuous visual parts of the background with skyline the strongest line of all

Distinctive: clearly marking a landscape or landscape feature as different from others

Dominant Elements: the basic elements (form, line, colour, scale and texture) in a particular landscape which exert the greatest influence on the visual character of the landscape

Edges: linear elements not used or considered as paths by the observer; the boundaries between two phases of linear breaks in continuity; e.g., shorelines, railroad cuts, edges of development, walls; lateral references rather than coordinate axes; may be barriers, more or less penetrable, which close one region off from another or seams or lines along which two regions are related and joined together. These edge elements, although probably not as dominant as paths, are for many observers important organizing features in their visual reaction to the landscape

Enhancement (visual): the creation of additional visual interest through conscious design efforts or by alteration of existing site conditions

Environmental Design Arts: art of design, planning, or management of the land, and the arrangement of natural and man-made elements through application of cultural and scientific knowledge, with concern for resource conservation and stewardship, to the end that the resultant environment serves useful and enjoyable purposes

Focal: drawing attention to a central item of interest

Foreground: see "Distance Zones"

Forest Landscape: a landscape in which the forest is the most dominant component

Form: the mass or shape of an object or objects which appear unified, such as in the shape of the land surface or patterns placed on the landscape

Front Lighting: see "Lighting"

Harmony: the combination of parts into a pleasing or orderly whole; congruity; a state of agreement or proportionate arrangement of form, line, colour, texture and scale

Imageability: that quality in a physical object or its surroundings which gives it a high probability of evoking a strong image in any given observer; the shape, colour, or arrangement which provides a strongly identified, powerfully structural, highly useful mental impact of the environment; the idea behind a place or landscape that can be readily understood in aesthetic terms, thus precluding fear of the unknown as well as increasing visual awareness; synonymous with "legibility"

Intactness: the integrity of visual order in the natural and man-built landscape, and the extent to which the landscape is free from visual encroachment

Interdisciplinary Team: a group of individuals with different training, representing the physical sciences, social sciences, and environmental design arts, assembled to solve a problem or perform a task; the members of the team proceed to solution with frequent interaction so that each discipline may provide insights to any stage of the problem and disciplines may combine to provide new solutions

Inter-visibility: the principle that from any point visible to an observer, the observer can also be seen

Intrusion: a feature (land and water form, vegetation, or structure) which is generally considered out of context because of excessive contrast and disharmony with the characteristic landscape

Key Observer Position (KOP): one or a series of observer positions on a travel route or at a use area or a potential use area, that are used to determine seen area

Landform: a term used to decribe the many types of land surfaces which exist as the result of geologic activity and weathering, e.g., plateaus, mountains, plains, and valleys

Landcover Units: geographically located areas of 1) water, 2) vegetation or 3) man-made development, each having a complete and consistent form, pattern and edge distinct from surrounding areas; sizes may vary, i.e., lake, forest, village

Landscape: landform and landcover forming a distinct visual pattern; portion of land that the eye can see in one glance

Landscape Character: the arrangement of a particular landscape as formed by the variety and intensity of the landscape features and the four basic elements of form, line, colour, and texture. These factors give the area a distinctive quality which distinguishes it from its immediate surroundings

Landscape Control Points: a network of permanently established observation sites which provide the means of studying the visual impact of alterations to the landscape; (similar terms are Obervation Points, Observer Viewpoints)

Landscape Features: the land and water form, vegetation, and structures which compose the

characteristic landscape

Landscape Inventory: a record of visible landscapes, landscape features and an estimate of landscape sensitivity

Landscape Management: the assessment, evaluation, design and manipulation of a landscape

Landscape Modifying Activities: actions which change the land and water form or vegetation or places structures on the landscape

Landscape Types: A unique segment of the environment, (or portion) which can be separated from other segments on the basis of the landcover and the landform

Landscape Unit: an area or volume of distinct landscape character which forms a unit spatially enclosed or part-enclosed at ground level; the extent of a landscape type which forms the dominant character of an area of landscape which is not spatiallly enclosed

Legibility (visual): see "Imageability"

Line: the path, real or imagined, that the eye follows when perceiving abrupt differences in form, colour, or texture; may be found as ridges, skylines, structures, changes in vegetative types, or individual trees and branches

Lighting:

Back Lighting: a situation where the light source is coming from behind the object being viewed; objects are generally in shadow with highlighted edge

Front Lighting: a situation where the light source is coming from behind the observer and falling directly upon the area being viewed

Side Lighting: a situation where the light source is coming from one side of a scene or object being viewed, usually the most critical for displaying contrast

Management Activity: an activity of man placed or undertaken on the landscape for the purpose of harvesting, traversing, transporting, protecting, changing, replenishing, or otherwise using natural resources

Middleground: see "Distance Zones"

Mitigation Measures: methods or procedures designed to reduce or lessen the impacts caused by development in visual activities on the environment

Modification: to reduce in degree or diminish in harshness the degree of visual contrast of a cultural intrusion or improvement

Mystery (in the landscape): relates to the observer's desire to obtain new information in the environment; created by variations of an ephemeral nature, e.g. a forest with interesting edges and open spaces, alterations in cloud cover and light intensity, variable shoreline configurations and other abrupt changes in the physical environment

Multidisciplinary Team: a group of individuals with different training assembled to solve a problem where each specialist works on a portion of the problem which is then discussed and analyzed after the team reassembles to propose final solutions

Nodes: the intensive foci to and from which one travels; may be primarily junctions, places of a break in transportation, a crossing or convergence of paths, moments of shift from one structure to another, or simply concentrations, which gain their importance from being the condensation of some use or physical character

Observer Position: a term employed to describe the observer's relationship between himself and the landscape he sees; used to indicate if he, the observer, is below, at the same level or above the visual objective. Three specific terms are used to define these positions: 1) observer inferior (below); 2) observer normal (same level); 3) observer superior (above)

Orogeny: the process of forming mountains by folding and faulting

Panoramic: an unobstructed or complete view of a region in every direction, hence a complete and comprehensive view

Pattern Conformity: the degree to which the line, form, colour, texture and scale of the development or management activity agrees with, rather than contrasts against, the basic visual pattern of the landscape setting related to its vividness. See "Contrast Rating"

Perception: man's impression of an object or space based on past and/or anticipated experiences; making oneself aware of all conditions and applicable factors; comprehension; to become aware of and grasp mentally through sight, but also through hearing, touch, taste, and smell

Photomontage: a composite picture or edited film in which contrasting shots or sequences are placed side by side or blended for the purpose of suggesting a total idea or impression

Physiographic Region: an extensive portion of the landscape normally encompassing many hundreds of square miles, which protrays similar qualities of landform and geomorphic origin

Portal: where the skyline dips to provide a threshold for drainage, access or outward views; useful in projects involving topographic extremes

Rehabilitation: a short-term management alternative used to return existing visual impacts in the natural landscape to a desired visual quality

Scale: the proportionate size relationship between an object and the surroundings in which the object is placed

Scarcity (of scenic quality values): a scenic resource which is very rare or unique within a region, or may be somewhat more common but, because of its outstanding characteristics, is unusually memorable

Scenic Area: an area whose landscape character exhibits a high degree of variety, harmony, and contrast among the basic visual elements which results in a pleasant landscape to view

Scenic Assessment Unit (SAU): a mapping unit useful in delineating scenic attributes, being a combination of natural and man-made boundaries

Scenic Quality: the degree of harmony, contrast, and variety within a landscape; the overall impression retained after driving through, walking through or flying over an area of land and/or water

Scenic Quality Class: the value assigned a scenic quality rating unit by applying specific assessment criteria indicating the relative visual importance of the unit to the other units within the physiographic region in which it is located

Seen Area: that portion of the landscape which can be viewed from one or more observer positions; normally limited by land form, vegetation, or distance

Seldom Seen: portions of the landscape which are

generally not visible from high and medium visual sensitivity level observer positions, and which are visible beyond approximately 24 km from those positions

Shape: spatial form, often two-dimensional, as differentiated from three dimensional form

Side Lighting: see "Lighting"

Sightline: the unobstructed line of sight between an observer and a viewed object, as used in the Landscape Control Point System

Simulation: the realistic visual portrayal which demonstrates the perceivable changes in the landscape features of a proposed management activity through the use of photography, artwork, computer graphics, and other such techniques

Spatial Values: three dimensional qualities of space within which an object occurs or management activity takes place. Areas high in spatial quality such as dramatic basins, cirques, valleys and enclosures hold visual value for the observer who can "identify" with such places and spaces (see "legibility")

Symbolisms: images of people, places and events which combine to form regional symbolism; relates directly to imageability, since each landscape represents a symbol, or combination of symbols, either natural or man-made. Regional symbolisms is a strong visual value determinant, e.g. in British Columbia, old, split-rail fences and rolling, grass covered hills symbolize the Caribou-Chilcotin area while forested valleys meeting the sea symbolize British Columbia's coastal marine environment.

Uniqueness: a resource-oriented criterion; a visual resource, visual character, or visual quality which is rare or uncommonly found at a regional or national scale; a valid part of any aesthetic evaluation or visual assessment; relates to the "memorability" aspect of "vividness"

Unity: the degree to which the visual resources of the landscape join together to form a coherent, harmonious visual pattern; refers to the compositional harmony or inter-compatibility between landscape elements

Use Volume: the total volume of visitor use each segment of a travel route or use area receives

Variables: any of several nonspecific factors influencing visual perception, e.g. distance, angle of observation, time, size or scale, season of the year, light, and atmospheric conditions

Variety: implies richness or diversity in the visual environment; often involves ecological diversity as well as aesthetic content; insures the maximum opportunity for visual stimulation and can become a source of mystery, complexity and high imageability. Variety in natural landscapes is desirable but may not always be so in some "man dominated" landscapes where uniformity may actually lead to greater visual compositional harmony

Viewer Exposure: the degree to which viewers are exposed to a view by their physical location, numbers viewing and duration of view

Viewer Groups: classes of viewers differentiated by their visual response to the development and its setting; response being affected by viewer activity, awareness and values

Viewer Response: a measurement of viewer response to change in visual resources including viewer exposure, viewer sensitivity, cultural

significance and local values

Viewer Sensitivity: the viewer's variable receptivity to the elements within the environment he is viewing, affected by viewer activity and awareness, i.e. he cannot readily notice every object and all the attributes of the objects that compose the total visual environment

Viewshed: all the surface areas visible from an observer's viewpoint; or from which a critical object or viewpoint is seen.

Existing and Topographic Viewsheds:

a) Existing Viewshed: the area normally visible from an observer's viewpoint, including the screening effects of intermediate vegetation and structures

b) Topographic Viewshed: the area visible from a viewpoint based on landform alone, without the screening effect of vegetation and structures.

Composite Viewsheds:

Definition: a composite of overlapping areas visible from a continuous sequence of viewpoints along a road or a network of viewpoints surrounding a road (or object); or visual corridor where each limited viewshed is a visually and spatially distinct experience

Vista: a confined view, especially one seen through a long passage, as between rows of houses or trees; often oriented toward, or focusing upon, a specific feature in the landscape; can be natural or created by man through design

Visual Absorption Capability (VAC): the physical capacity of a landscape to screen proposed development and still maintain its inherent visual character. Two major factors affecting the absorption capability of a landscape are: 1) the degree of visual penetration, and 2) the complexity of the landscape. The degree of visual penetration (i.e., the distance into the landcape that you can see from a vantage point) is affected both by vegetation and topography. The higher the visual penetration, the lower the ability of the landscape to visually absorb development and still maintain its existing visual character; the higher the visual complexity within a landscape, the greater the visual absorption.

Visual Alteration: the degree of change in visual resources imposed by development activity, assessed without regard to viewer response

Visual Assessment Units (VAU): synonymous with scenic assessment units (SAU)

Visual Compatibility: the degree to which any development with specific visual characteristics is visually unified with its setting; can be evaluated with reference to pattern conformity and character blend

Visual Corridor: a continuous succession of visually and spatially distinct experiences; series of consecutive or composite viewsheds. See "viewsheds"

Visual Impact: expression experienced by the observer of the visual landscape which may be strong and overpowering or indistinct and weak; the degree of change in visual resources and viewer response to those resources caused by development activity and operations

Visual Information: the identity of landscape elements such as mountains, valleys, rivers, forests, towns or highways; the message conveyed by signs and symbols in verbal or graphic form

Visual Interpretation: the process of judging or evaluating the visual appearance of objects and/or their setting

Visual Quality: can generally be grouped under four major headings: vividness, variety, unity, and uniqueness

Visual Quality Objective (VQO): a desired level of excellence based on physical and sociological characteristics of an area; refers to degree of acceptable alteration of the characteristic landscape

Visual Resource Management (VRM) Objectives: Statement of a Visual Resource Management result to be achieved, specifying 1) management principles, 2) measure of effect, 3) visual resources to be managed, and 4) viewing group(s) for which resources are to be managed

Visual Resource Management Area (VRMA): a recommended geographic unit for the management of visual resources; homogenous with Biotic subregion in the User Guide

Visual Resources: the appearance of the features that make up the visible landscape. Includes the land, water, vegetative, animal, and other features that are visible on land and water

Visual Resource Management Class (VRMC): the degree of visual change acceptable within a designated portion of the characteristic landscape; based upon the physical and sociological characteristics of any given homogeneous area and serving as a management objective

Visual Sensitivity Levels: an index of visual sensitivity of the landscape based upon its inherent scenic attractiveness coupled with its capacity to evoke imageability in the viewer

Vividness: qualitative aspect(s) of the visual environment rendering it distinctive by creating a strong visual impression of either a single composition or series of compositions over time which may combine in striking patterns

APPENDIX B. USER PREFERENCE FACTORS

The landscape preference stage of the visual assessment process involves the identification of value judgements and measurement of public preferences for the visual landscape.

In many cases, public reaction to proposed developments affecting the landscape's visual quality will have been voiced prior to the initiation of visual impact assessment. In fact, the readily apparent impacts on the visual landscape resulting from development are often cause for initiation of impact assessments. Therefore it is important that there be early public involvement in the visual resource planning process - particularly in light of subjective values involved in any landscape evaluation.

Public outcry is often emotional. The public therefore requires the support of inventory, a rational assessment of the proposed project's visual impact and potential design required to mitigate impact.

Since the visual resource may often be unseen by the potential public observer, or user, the visual assessment process could be easily overlooked. For this reason, landscape preference guidelines are essential. Current techniques for measuring such preferences are still in their early development.

USER GROUPS

The term "user groups" refers to various groups of users who may be affected by any proposed development affecting the landscape visually. Most users prefer one type of landscape over another, depending upon their social and cultural values. For example, what an Albertan might find scenically beautiful in rolling prairie vistas might bore the mountain-oriented British Columbian and vice versa, yet both have the right to hold these views and are correct in doing so. However, generalized preferences for variety, unity, dominance and harmony in the landscape can be seen to follow an observable pattern of concensus with users, regardless of origin. Such preferences can, and do, change in time as cultural attitudes, opportunities for experiencing the visual environment and scarcity of quality visual resources are affected. This factor should be carefully noted in any user preference assessment.

Thus it is most important to weigh public preference factors with other considerations such, for example, as the necessity to establish wilderness and ecological reserves for all time; weighing social and economic variations in land planning and allocation. Public preference factors should be tested wherever possible by such methods as nominal grouping of "original" and "final preferences" by means of workshop sessions[1]; by estimation of scenic beauty preferences through photographic testing and similar systems currently in practice (Shafer, et al., 1973, Blair, 1981).

VIEWER SENSITIVITY

Viewer sensitivity refers to the observer's variable receptivity to elements being viewed. This receptivity is conditioned by the following factors:

1 - the extent to which view elements have attracted or otherwise affected him in current and past visual experiences
2 - the degree to which he is affected by elements of the view or by his own expectations
3 - the degree to which he is affected by his own expectations
4 - his viewing position in the landscape, i.e., observer above, below and normal

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[1] Very often "original" preferences stem from preconceived attitudes which, through workshops with others, may change if their biases are disclosed.

(see Section A - Concepts)

5 - preconceptions of what the landscape "will", "might" or "should" look like after modification

6 - the sense of an area, such as "a coastal-forest-marine-landscape" or an "urban-rural transition zone". Other examples include such combinations as "managed forest" or "agricultural landscapes with mountainous backdrops." (See Glossary of Terms, "Legibility" for further clarification of this variable).

CULTURAL FACTORS

Values of the visual resource relate directly to educational and cultural elements in the landscape. Parks, historic sites and especially designated reserves may hold regional or national values as unique visual experiences attracting a number of different viewer groups. The values of the landscape as a whole or of each visual resource are stated not only as expressed individual preferences but also as cultural norms (Andrews, 1979).

LOCAL GOALS AND OBJECTIVES

Visual features in the landscape not readily observable in the field may and often do determine the attraction of a view or scenic area. These may not be apparent or meaningful to "outsiders" but are highly valued by residents within the area. An example would be a site holding local historical or botanical interest such as a small commu.ity park, a canyon, trail or local swimming hole. These features often translate themselves into local goals and objectives for designation and protection and can usually be identified only by personal contact in the field or by mailed questionnaire surveys.

THE EVALUATOR: SUBJECTIVE FACTORS

Not to be overlooked during the landscape preference stage of assessment is the danger that the manager's subjective feelings, expectations and attitudes toward the landscape under study may well prejudice his findings and preclude the acceptance of differing public attitudes. At times it can be difficult for him to differentiate between what the landscape tells him (his knowledge) and how his own feelings enter into the process. This is further complicated by adoption of an advocacy role if, in addition to holding his own personal biases, he also represents a land management agency. Thus he can profit well by exposing his technical knowledge and judgement to public review. Current techniques do not yet tell landscape managers enough about "ordinary" people's understanding, about their own understanding of people's landscape preference and about the reasonableness of effectively combining these attitudes and aptitudes into the management plan (Andrews, 1979).

THE COMMUNITY INVOLVEMENT PROCESS

Public involvement is an essential ingredient in determining user preference factors and public reaction to design proposals. Nowhere in the resource allocation and management process is this more the case than in visual assessment, which is largely subjective. These subjective elements must be identified by both the visual resource analyst and concerned public on an interactive basis. This process can and should be initiated very early in the study program, once terms of reference for the project have been clarified and the inventory and narrative development proposal, with alternatives, has been prepared. The material can then more clearly be reviewed at workshops or scheduled public hearings. Public involvement in the assessment process must take place before, not after, decisions are made.

THE PROCESS

There are three major objectives involved in the community involvement process (Jones and Jones, 1977).

1 - to distribute information to the public

2 - to gather pertinent information from the public
3 - to ensure that information from the public is considered along with technical information early and continuously in an interactive process.

Fraser (1982) defines three principle methods of achieving community involvement:

1 - public information methods (press releases, pamphlets, "viewing" centers field trips, etc.)
2 - consultation methods (written briefs, plan reviews, public meetings and workshops)
3 - extended involvement methods (public advisory committees, task groups, joint planning teams)

Some specific ways in which public involvement can be used include 1) determining which resources are most valued in a community and the nature of public concerns about a project 2) checking resource inventories and gathering suggestions on the development of alternatives and 3) obtaining direct viewer response to alternatives.

Technical information should be simplified into sketch formats. Simplified graphics, hand-drawn maps and pertinent photographs are more likely to elicit comments than a detailed and possibly confusing series of complicated maps. Content of the subject matter for presentation at public hearings varies so much from one project to another that it is difficult to set any firm guidelines. Nevertheless the presentation should definitely contain:

1 - the problem statement and terms of reference for the project
2 - map and graphic illustrations of the area in its present state: the descriptive inventory
3 - clear and concise overlay studies of development activities proposed (e.g. hydro line, surface mine, etc.) either by photographic simulation, sketches or computer graphics
4 - alternative placement of the activity on the landscape with probable visual impact consequences clearly stated
5 - a proposal with alternatives

THE SETTING

The "set" or setting for the workshop or public hearing refers to placement of the public involvement in an area conducive to individual and group participation. This is essential to the community involvement process, since all too often a proposal for development fails to meet public approval due to its presentation in inappropriate surroundings. The setting must be comfortable, free from outside disturbances, adequately illuminated and suitably arranged for information seating and individual participation. Visual aids strongly favor communication and interaction. For British Columbia see Fraser, 1982.

FURTHER REFERENCES TO USER PREFERENCE FACTORS

In view of the complexity of social and psychological factors involved in establishing user preference factors, a matter beyond the scope of this document, the reader is referred to the following sources: Craik, 1968, 1972; Daniels, Boster, et al., 1976; Shafer and Tooby, 1973; Kaplan, 1975; Zube, 1974 and Zube, Brush and Fabos, 1975.

APPENDIX C. MANAGEMENT PLANNING CONSIDERATIONS (ADOPTED AND MODIFIED FROM U.S.D.A. FOREST SERVICE, 1972)

VALUES INVOLVED: GENERAL

1 - Will benefit (social, economic) accrue to the community at large from the proposed project?
2 - Are the potential project benefits of short or long-term social and economic benefit?
3 - Will the project benefits offset the losses to both present and potential users of the area?

PHYSICAL REALITIES

1 - If the project is brought to completion, what are the actual visual biophysical-ecological effects involved?
2 - Is the site or area suited to the project's intent in a Provincial sense? In a regional or local sense? In a national sense?
3 - Have site or area limitations and opportunities been adequately analyzed by qualified personnel?

CONSTRAINTS TO DEVELOPMENT SPECIFICALLY RELATED TO VISUAL QUALITY

1 - What economic, technological, design, labor and policy constraints will affect the project's visual impact potential?
2 - Can the originally expected project - if visual impacts are high - be altered in any way in order to meet Visual Resources Management Area objectives?
3 - If not will the stated constraints still allow for a quality product that will satisfy human values i.e., assuming a lesser degree of visual quality?

DOCUMENTATION OF FINDINGS

1 - Are the visual assessment documents (maps, drawings, narrative account etc.) which convey the project's intent to the public involved or affected by the proposed development clear and concise?
2 - Do such documents provide for adequate quality control and serve as suitable guides for monitoring the project's visual impact while it is in process or subsequent to completion?

MANAGEMENT ALTERNATIVES

1 - In meeting Visual Management Class requirements (Visual Quality Objectives) which alternative (i.e. rehabilitation, re-location, etc.) will be most appropriate in view of its expected physical, aerial, and economic effects.
2 - Given the alternative, is it practical, in view of constraints, to proceed with its delineation?
3 - Should short and long term visual quality objectives be specified under a monitoring program? If so will they meet sensitivity class requirements in the final analysis?

PROJECT CONCLUSIONS

1 - If concurrence is reached between project intent and actual visual (physical), social and economic values, evaluation of the project may be termed "complete" and acceptance of the development recommended
2 - If such concurrence is not achieved, further actions that will lead toward completion may be necessary, depending upon project priority (policy). This may entail re-processing inventory and evaluation for each alternative.

APPENDIX D. RECOMMENDED FIELD EVALUATION FORMS

APPENDIX D.1

Assigning Visual Resource Contrast Ratings (Proposed Field Form #1)

VISUAL RESOURCE CONTRAST RATING SHEET

Project Name — **Date**

Location — Map: _____ Scale: _____

Regional District: _____

Strategic Planning Area: _____

Section: _____ Range: _____ Township: _____

Longitude: _____ Latitude: _____

Sketch Map

VRMA: _____

Landscape Unit: _____

Evaluated By: _____

Checked By: _____

Visual Resource Management Class: _____

Key Observation Point _____

Characteristic Landscape

	Element	Descriptors[1]	Comments
LAND/WATER	Form	Landform (3-D) water, soil pattern	
	Line	Regularity/continuity	
	Color	Soil, rock, ice, snow, hue, value, chroma	
	Texture	Clarity, grain	
	Scale	Landform/waterform mass and area	
VEGETATION	Form	Regularity, simplicity, orientation	
	Line	Direction, regularity edge character	
	Color	Hue, value, chroma	
	Texture	Clarity, grain	
	Scale	Size, area surrounding objects	
STRUCTURES	Form	Regularity, simplicity orientation	
	Line	Direction, regularity continuity, simplicity	
	Color	Reflectivity, hue value, chroma	
	Texture	Clarity, grain	
	Scale	Size, height, width, surrounding areas	
LANDSCAPE	General Description	Define characteristic landscape, regional setting etc.	
	Scale	Expansive, bounded, area enclosure; visual unit	
	Spatial Composition	Focal, feature enclosed, panoramic canopied; weak to strong	

[1] Refer to Chapter II, Concepts (Adapted from USDI Bureau of Land Management, 1978 and Smardon et al., 1982).

APPENDIX D.2

Establishing Contrast Rating Scores for Project Visual Impacts (Proposed Field Form #2)

1

Relative Importance of Visual Elements in Contrast Ratings

Procedure:
Multiply weighting assigned to each visual element against degree or contrast, i.e., strong (3) moderate (2) weak (1) and none (0)

Visual Elements & Weighted Values	Introduced or Modified Components		
	Land/Water	Vegetation	Structures
Color Contrast (4x) Weighting	High 12 Moderate 8 Low 4 None 0	High 12 Moderate 8 Low 4 None 0	High 12 Moderate 8 Low 4 None 0
Form Contrast (4x) Weighting	High 12 Moderate 8 Low 4 None 0	High 12 Moderate 8 Low 4 None 0	High 12 Moderate 8 Low 4 None 0
Line Contrast (3x) Weighting	High 9 Moderate 6 Low 3 None 0	High 9 Moderate 6 Low 3 None 0	High 9 Moderate 6 Low 3 None 0
Texture Contrast (2x) Weighting	High 6 Moderate 4 Low 2 None 0	High 6 Moderate 4 Low 2 None 0	High 6 Moderate 4 Low 2 None 0
Scale Contrast (3x) Weighting	High 9 Moderate 6 Low 3 None 0	High 9 Moderate 6 Low 3 None 0	High 9 Moderate 6 Low 3 None 0

2

Overall Rating

To arrive at an Overall Rating one must review the Contrast Rating (box #1) and use the criteria listed below.

Overall High if 1-3 components high or 3 components medium

Overall Medium if 1-2 components medium with no higher ratings

Overall Low if 1-3 components low with no higher ratings

Overall None if all components None

	Overall Element Ratings	Overall Element Scores
Color	High 12 Moderate 8 Low 4 None 0	
Form	High 12 Moderate 8 Low 4 None 0	
Line	High 9 Moderate 6 Low 3 None 0	
Texture	High 6 Moderate 4 Low 2 None 0	
Scale	High 9 Moderate 6 Low 3 None 0	
Total Contrast Score		

3

Scale Dominance

Major object in confined setting	Dominate	12
One of several major objects or major object in an unconfined setting	Co-dominate	8
Significant object relative to setting	Subordinate	4
Small object relative to setting	Insignificant	0

Comments

4

Composite Visual Impact Severity

Add the score from box #2 (Overall Contrast Rating) to the score from box #3 (Scale Dominance) to get the Composite Visual Impact Severity Number. Compare the CVIS Number with the accompanying table to choose the Sensitivity Class.

Composite Visual Impact Severity ☐

Class I and I(SZ).....	Negligible	0 - 11
Class II.....	Low	12 - 23
Class III.....	Moderate	24 - 35
Class IV.....	Strong	36 - 47
Class V and V(R) and V(E)....	Severe	48 - 60

5

Summary

Project Name: _____

	Class	Severity	Score
Project Visual Impact			
Visual Resource Management Class Requirement (maximum)			

Does the project meet the Visual Resource Management Class Requirement?

Yes ☐

No ☐

Assessor: _____ Date: _____

APPENDIX D.3

Field Evaluation Forms: Coastal Marine Landscape Scenic Rating System
(Source: Edaw et.al., 1981)

F1

AESTHETIC RESOURCE RATING FORM
FIELD INVENTORY

DATE:
REGION: NC SF NCC SCC
COUNTY
SEGMENT
LANDSCAPE UNIT:
EVALUATOR:

SCENIC RESOURCE RATING

COMPONENTS OF THE COASTAL LANDSCAPE

	PHYSICAL INVENTORY	DISTINCTIVENESS (MAX. 35 PTS.) H / M / L	VARIETY (MAX 10 PTS.)	HARMONY (MAX. 25 Pts.)
LAND FORM	COAST: ___ dry sandy flat; ___ sand dune; ___ low coastal terrace; ___ high coastal terrace; ___ head land BACKDROP: ___ coastal plain; ___ hills; ___ canyons & ravines; ___ mountains	10 / 6 / 2	HIGH 10	HIGH 25
VEGE TATION	___ dune; ___ grassland; ___ brushland; ___ woodland; ___ mixed; ___ riparian; ___ kelp; ___ landscaped	5 / 3 / 1		
WATER'S EDGE & OFF SHORE	___ inward; ___ outward; ___ straight; ___ exposed; ___ semi-protected; ___ protected; ___ offshore rocks and sea stacks; ___ rocky intertidal; ___ cobble beach; ___ wet sandy beach; ___ wetland; ___ river mouth; ___ cove	10 / 6 / 2	MEDIUM 6	MEDIUM 15
CUL TURAL MODIFI CATION	___ pasture; ___ cultivated; ___ rural; ___ med. dens. residential; ___ urban; ___ industrial; ___ military; ___ airports; ___ highways; ___ bridges; ___ railroads; ___ fill (undeveloped); ___ fishing (sport & commercial); ___ breakwater; ___ marina; ___ recreational area; ___ natural area; ___ historical, cultural, or rec. landmark; ___ lighthouse; ___ artificial island; ___ offshore structures; ___ commercial forestry; ___ fishing harbor; ___ industrial harbor; ___ pier	10 / 6 / 2	LOW 2	LOW 5
	*If no cultural modification present, score 10.	+ / +		

REMARKS

☐ + ☐ + ☐

OVERALL SCENIC RESOURCE RATING = ☐
Minimum Rating: 14 Maximum Rating: 70

OTHER AESTHETIC CONSIDERATION

SOUNDS	SMELLS	EPHEMERAL: WILDLIFE	EPHEMERAL: HUMAN
___ streams; ___ ocean; ___ wind; ___ wildlife; ___ transportation; ___ industry; ___ human; ___ foghorns	___ sea; ___ fish and other; ___ vegetation; ___ animals; ___ vehicles; ___ industry; ___ waste disposal	___ marine mammals; ___ birds; ___ terrestrial wildlife; ___ livestock	___ commercial fishing; ___ recreational boating; ___ ships; ___ surfing; ___ hang gliding; ___ people gathering

REMARKS

OTHER AESTHETIC RATING SCORE IN INCREMENTS OF 5 ☐
MOST NEGATIVE SCORE: 0
IF NO SIGNIFICANT OBSERVATIONS, SCORE 15
MAX. POSITIVE SCORE: 30

OVERALL AESTHETIC RATING

- ☐ HIGH (83/100)
- ☐ MEDIUM HIGH (66/82)
- ☐ MEDIUM (49/65)
- ☐ MEDIUM LOW (32/48)
- ☐ LOW (14/31)

ENTER TOTAL SCORE

APPENDIX D.4

Field Evaluation Forms: Definition and Rating Criteria for Coastal Marine Inventories. (Source: Edaw et.al., 1981)

DEFINITIONS AND RATING CRITERIA

DISTINCTIVENESS:
A measure of the unique, bold, dramatic and memorable qualities of the visual landscape

	KEY WORDS	HIGH	MEDIUM	LOW
		• spectacular • dramatic • unusual/unique • impressive/ memorable • bold/prominent • high contrast	• evident • modest • moderate • varied • intermediate	• monotonous • commonplace • subdued • low contrast • indistinct • forgettable
LANDFORM	RELIEF SKYLINE ENCLOSURE FEATURES	• high, steep, rugged, deeply dissected • bold, dramatic skyline • strong, varied enclosure • unusual rock forms and colors, peaks, gorges	• moderate relief and slopes, some complexity and contrasts • varied skyline • moderate enclosure • some contrasting features but not dominating views	• low relief, flat and gentle slopes, subdued forms • uninteresting skyline • little or no marked enclosure • no significant contrasting features
		e.g., mountains, ravines, high terraces, sculptural rock forms	e.g., hills, valleys, terraces, low cliffs, bluffs, dunes	e.g., coastal plains
VEGETATION	PATTERNS SPECIMENS & FEATURES	• striking vegetation, patterns of high contrast, open or forested • unusual or dramatic plants or groups, forms	• some contrast and interest in patterns of texture and colors, species mix • varied plant form and grouping but not dramatic	• subdued variation or uniformity in vegetation types and appearance • no contrasting patterns or plant forms, commonplace forms, colors, textures, size, distributions
		e.g., big redwood forests, coastal cypress forms, strong contrast in meadow and bishop pine forest, windpruned bay forest	e.g., scattered openings in Douglas Fir forest, mixed woodland (oak bay), saltmarsh	e.g., uniform chaparral, coastal plain vegetation, dense Douglas Fir forest
WATER'S EDGE & OFFSHORE	SHORELINE COASTAL RELIEF FEATURES	• unusual boldness, shape, or complexity of shoreline, high color and form contrast • steep, high, dissected, dramatic • islands with bold form, sea stacks, rocky coves, waterfalls, steepsided inlets	• distinct and well demarcated, some contrast in colors or materials • moderate relief, variety in slope and evaluation • some features evident but not dominating, e.g., reefs, wave action	• indistinct shoreline, undifferentiated • extensive and subdued forms, low contrast, low lying or flat, no strong features contributing to the unit
		e.g., islands, dramatic lagoons and spits	e.g., estuaries, river mouths, varied beaches	e.g., straight beach
CULTURAL MODIFICATION	STRUCTURAL NON-STRUCTURAL	• dramatic or symbolic structures, high contrast in scale, form, or unique assemblage of structures • striking patterns in scale, form, or color	• varied, some contrast in design elements or structures but not dominant or very distinguished • moderate contrast and interest in patterns	• undistinguished, monotonous, subdued, commonplace • low contrast in scale, form, color, and texture
		e.g., landmarks, lighthouses, prominent closeouts, historic structures, historic settlements, power plants	e.g., cultivated fields, varied housing, urban centers	e.g., minor roads, sprawl, unused fill, extensive monoculture, repetitive tract housing

VARIETY:
A measure of the difference among and between design elements (form, line, color, textures) in space

HIGH	MEDIUM	LOW
• a diverse representation of design elements • lasting interest in the design elements present and their interrelationships • a high degree of alternation of views constituting visual sequence • a number of focal landmarks present within segment or landscape unit	• a notable difference in variation within one or two basic design elements; however, others are generally uniform • some differences in views, with their sequence comprehensible and memorable • cultural modifications noticeable and at times distinctive but generally compatible with the characteristic landscape	• regularity in and between design elements, homogeneity is the dominant trait throughout the entire unit • a minimum of visual sequence, monotonous, with a little or no variation of views

DEFINITIONS AND RATING CRITERIA
(concluded)

HARMONY:
A measure of the agreement of elements brought together within the visual landscape; a pleasing congruent arrangement of the par

HIGH	MEDIUM	LOW
• an obvious similarity and high degree of unity in the basic design elements and scale • elements of the characteristic landscape or cultural modifications are singularly dominant and congruent • overall sense of simplicity and order	• cultural modifications are intermittent but are reasonably ordered and defined • some incongruities exist between the design elements of the characteristic landscape and cultural modifications features; eclectic or chaotic	• cultural modifications within the landscape oppose or compete for interest with each other and/or the characteristic landscape • a high degree of visual conflict between

A. AESTHETIC RESOURCE: that quality of the environment perceived through visual as well as other sensory experiences (i.e., hearing and smell)
B. SCENIC RESOURCE: that quality of the environment perceived through the visual senses only
C. COMPONENTS OF THE COASTAL LANDSCAPE: for the purposes of the scenic resource rating, the landscape had been divided into four components: landform, vegetation, water's edge and offshore, and cultural modifications
D. PHYSICAL INVENTORY: those features present within the viewshed from a given viewpoint

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POOR

QUALITY

ORIGINAL